SMITHSONIAN
LIBRARY

SHOUT
SHARE
IT

SMITHSONIAN INSTITUTION
UNITED STATES NATIONAL MUSEUM
Bulletin 137

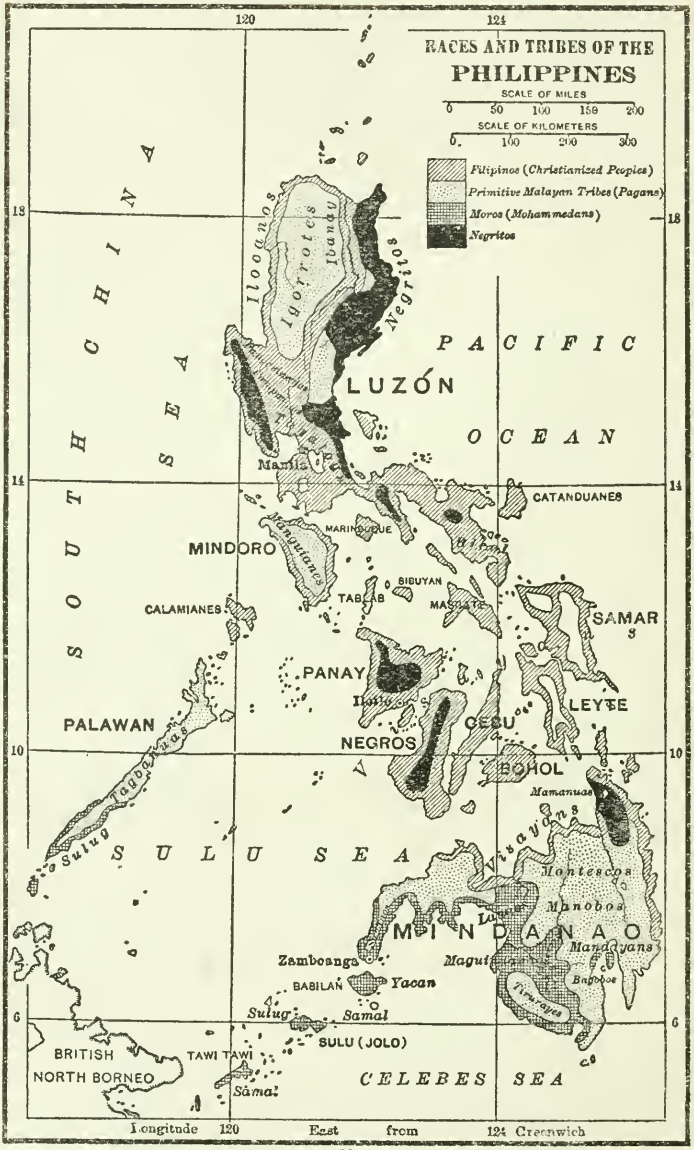
THE COLLECTION OF PRIMITIVE WEAPONS AND ARMOR OF THE PHILIPPINE ISLANDS IN THE UNITED STATES NATIONAL MUSEUM

BY

HERBERT W. KRIEGER
Curator of Ethnology, United States National Museum

SMITHSONIAN
MAY 26 1959
LIBRARY

WASHINGTON
GOVERNMENT PRINTING OFFICE
1926



30

MAP OF THE PHILIPPINE ISLANDS

SMITHSONIAN INSTITUTION
UNITED STATES NATIONAL MUSEUM
Bulletin 137

THE COLLECTION OF PRIMITIVE WEAPONS AND ARMOR OF THE PHILIPPINE ISLANDS IN THE UNITED STATES NATIONAL MUSEUM

BY

HERBERT W. KRIEGER
Curator of Ethnology, United States National Museum

WASHINGTON
GOVERNMENT PRINTING OFFICE
1926

ADVERTISEMENT

The scientific publications of the National Museum include two series, known, respectively, as *Proceedings* and *Bulletin*.

The *Proceedings*, begun in 1878, is intended primarily as a medium for the publication of original papers, based on the collections of the National Museum, that set forth newly acquired facts in biology, anthropology, and geology, with descriptions of new forms and revisions of limited groups. Copies of each paper, in pamphlet form, are distributed as published to libraries and scientific organizations and to specialists and others interested in the different subjects. The dates at which these separate papers are published are recorded in the table of contents of each of the volumes.

The *Bulletin*, the first of which was issued in 1875, consists of a series of separate publications comprising monographs of large zoological groups and other general systematic treatises (occasionally in several volumes), faunal works, reports of expeditions, catalogues of type-specimens, special collections, and other material of similar nature. The majority of the volumes are octavo in size, but a quarto size has been adopted in a few instances in which large plates were regarded as indispensable. In the *Bulletin* series appear volumes under the heading *Contributions from the United States National Herbarium*, in octavo form, published by the National Museum since 1902, which contain papers relating to the botanical collections of the Museum.

The present work forms No. 137 of the *Bulletin* series.

ALEXANDER WETMORE,
Assistant Secretary, Smithsonian Institution.

WASHINGTON, D. C., *October 18, 1926.*

TABLE OF CONTENTS

Page

Introduction 1

History of the weapon collections in the United States National Museum from the Philippine Islands. Objectives.

Development of Philippine weapons and tribal cultures 8

Early differentiation of primitive weapons and implements. Specialization of pointed, edged, and striking weapons through the introduction of metals. Methods of classification and types of Philippine weapons of offense and defense. Nonmetallic materials used in the construction of weapon parts. Methods of metal production and metal working. Ethnic contacts and culture traditions as influencing weapon types. The native population: Ethnic stocks and ethnic stratification. Negritos. Indonesians, Mohammedan, Christian, and Pagan Malayan stocks. Historical culture contacts with Asia and Europe. Casting of brass cannon and use of firearms. Indonesian and Malayan culture survivals.

Bow and arrow 30

Characteristic features of the Negrito bow and arrow. Antiquity of the bow in Malaysia. Malaysian self-bow; parts, function, materials. Philippine arrow poisons. The cross bow. Type specimens of bows, arrows, and quivers.

Clubbed weapons for bruising and crushing 45

Distribution, classification, and function of curved war clubs. War clubs. Wooden sword club. Clubbed shields. Sawfish blade. Sting ray whips. Flagellation rods.

The spear: Its use in warfare and the hunt 49

Distribution and antiquity of the Malaysian spear, parts and materials employed in construction. Catalogue of type specimens. Chevaux de Frise, path splinters, and pitfalls. Caltraps.

Blowgun or sumpitan 57

Distribution and function. Use of the blowgun by the Negrito. Parts to be considered: methods of manufacture. Catalogue of type specimens.

Metallic hand weapons for cutting and piercing: The parang, the bolo, and the dagger 62

Distinction between the parang and the bolo. Two generalized types of Philippine swords. Social significance of the bolo. Vocabulary of Philippine metallic hand weapons. Type weapons and models. Description of type specimens.

Head hunting and associated ceremonial weapons 87

Institution of head hunting. Substitution of human sacrifice and blood money. Catalogue of type weapons.

Weapons of defense: Shields and armor 96

Distribution of Philippine shield types; function and materials employed. Type shields in Museum collection. Body armor and helmets. Distribution of the cuirass and helmet; origin; materials. Type specimens of body armor in Museum. Type specimens of brass helmets.

Bibliography 113

Explanation of plates 115

Index 121

THE COLLECTION OF PRIMITIVE WEAPONS AND ARMOR OF THE PHILIPPINE ISLANDS IN THE UNITED STATES NATIONAL MUSEUM.

By Herbert W. Krieger

Curator of Ethnology, United States National Museum

INTRODUCTION

History of the weapon collections in the United States National Museum from the Philippine Islands.—The earliest accessions to the weapon collection from Malaysia came from the United States exploring expedition, 1838–1842, under Capt., later Admiral, Charles Wilkes. Objects included were such as could be obtained at the ports of call, Manila, Singapore, and other seaports in eastern and western Malaysia. The swords, daggers, spears, and other weapons obtained by this expedition show but little trace of recent European design and influence. The weapons obtained by the Wilkes expedition are thus of great value in any study and classification of the early influences other than European which have operated in shaping the design and technic of the metal work, arms, and armor of the Philippine Islands. The collection was brought to Washington and unpacked at the United States Patent Office where the weapons were exhibited for several years. In 1851 they were transferred to the Smithsonian Building. A catalogue of the collection was made by T. R. Peale, of the Patent Office, in 1846 and presented to the United States National Museum in January, 1877.

Under the stimulus aroused by the Spanish-American War and the native insurrection in the Philippines, additional accessions of Philippine weapons and armor began to arrive at the National museum. Most of the collectors were officers in the United States Army. As the field of operations of the Army was widespread throughout the islands of the Philippine Archipelago, it was possible to include in the collections weapons from those sections where the natives were especially adept in the metal crafts. It is through the interest and cooperation primarily of officers of the United States Army that the weapon collection from the Philippine islands in the United States National Museum is of a comprehensive and representative nature.

In 1901, Gen. J. M. Bell, United States Volunteers, collected a suit of armor, varieties of spears, bows and arrows, shields, bolos, and knives from the Bikol Peninsula, southern Luzon Island. In the same year another collection was received from J. M. Harkins consisting of Moro shields, lances and spears, axes, knives, daggers, and swords; also of Negrito and Tagalog weapons and cutting implements employed in agriculture.

Col. Frank F. Hilder, of the Bureau of American Ethnology, was sent to the Philippine Islands in 1900 for the purpose of making a large collection of ethnological objects for the Pan-American Exposition to be held in Buffalo in 1901. This material was received in Washington, prepared and sent to Buffalo, afterwards to the Charleston Exposition, and, finally, was turned over by the Government board to the United States National Museum. The collection includes industrial and agricultural cutting tools of iron and steel from the Tagalog of central Luzon, such as knives for cutting and shredding Manila hemp "abaca," hat and basket maker's tools from Bulacan Province, coconut huskers and shredders in the form of animal wood carvings with inset metal headpiece, and steel blades for grass "zacate" cutting. A rice reaper or sickle with hook-shaped handle and with steel cutting blade fastened on the under side of the grip is so fashioned that the hook gathers in the rice while the knife cuts it at one operation, thus incorporating in this instrument the essentials of a primitive reaping cradle.

Among the weapons collected by Hilder are bows and arrows from the island of Jolo, such as were used by the Moro; the bows are of bamboo and rattan, have a braided rattan bow cord, and the arrows are of cane with palmwood head. Moro spears with steel blade, long brass ferrule, and hardwood shaft are included together with another type of spear having a steel blade fastened into a wooden socket with adhesive gum and fixed to a bamboo shaft; other spears are of the type of war spear with barbed head employed by the Igorot. Included in the collection is an example of cord armor from the Mindanao Moro together with a typical collection of Moro swords and daggers, also a collection of 90 miniature models of Moro and Tagalog weapon types.

Dr. Robert B. Grubbs, United States Army, in 1903, while assigned to Philippine duty, collected among the Moro of Iligan, Mindanao, a number of ancient brass helmets of Spanish and Moro native workmanship, also old Spanish and Moro coats of mail with brass and horn plates and other weapons of Moro manufacture. Included are kampilans, some made in imitation of damascus steel blades, others inlaid with dragon etchings; krisses from the Lake Lanao region; beheading swords and headman's axes; Moro lances, bows and arrows.

During his detail as surgeon in the Philippine Islands, Dr. E. A. Mearns, United States Army, took part in punitive expeditions against the Moro of Mindanao. While in the field he collected many ethnological specimens and sent them to the Museum as a gift in 1904. Circular and oblong parrying shields from Balimbang, Tawi Tawi, and examples of Tinggian and Bagobo knives, axes, spears, and daggers are noteworthy objects of this collection.

Alonzo H. Stewart, upon leaving for the Philippines, was requested to make a collection of Bagobo ethnological objects from Davao, southeast coast of Mindanao. The material collected consisting of the weapons and knives employed by a Bagobo family was obtained by the Museum in 1904.

A large collection of Philippine ethnological material including weapons and armor was received as a gift from the Philippine Commission at the close of the Louisiana Purchase Exposition, St. Louis, Mo., in 1904. This collection was shipped to the American Museum of Natural History, New York City, and from there a portion was forwarded to the National Museum in December, 1905. Additional material from the Philippine World's Fair Commission was received direct from St. Louis. The collection includes several Negrito bows; shields and quivers from Ilagan, Isabella Province; compound or trident arrows from the province of Tarlac, Luzon; shields, quivers, and arrows from the Tinggian tribe of northern Luzon; Mangyan bows, blowguns, harpoons, fishing, hunting, and war spears; swords and head axes of the Mindanao Moro; swords and shields of the Bagobo of southeastern Mindanao; war clubs of the Subanun; also many agricultural, industrial, and semiwarlike implements from the Christianized native tribes. The collection is especially rich in metal workers' tools and in technological metal objects.

In 1908 Capt. G. P. Ahern, United States Army, presented a collection of Philippine weapons to the United States National Museum comprising Moro circular hardwood shields; Moro spears and arrows, including a spearhead fashioned after the Chinese style with a ceremonial heavy cast brass dragon encircling the blade; a Visayan sword with grotesque hilt carving patterned after the Javanese conception; bolos with grip and leather scabbard modeled after the European sword but preserving Filipino characteristics as to shape of blade; semicircular Moro beheading knives and Igorot head axes; heavy old Spanish halberds with open-work iron blade in medieval ecclesiastical design, formerly used in the Malacanan Palace in Manila.

Capt. Jesse R. Harris, United States Army, in 1907, presented to the Museum his collection of Filipino knives and Moro swords, cuirass, and shields. At the time of the Seattle Exposition, Army

Chaplain Joseph Clemens, United States Army, disposed of his valuable collection to the Museum for its exhibit there. In 1910, Mrs. H. C. Corbin presented the collection of Moro weapons collected by her husband, the late Gen. H. C. Corbin, United States Army.

Specimens collected by the late Maj. Gen. Frederick Dent Grant during his campaigns in Samar were presented to the Museum in 1912. Included are a miscellaneous collection of lances, bolos, daggers, krisses, chopping knives, and swords. Through Mrs. H. G. Lyon, the collection of the late Maj. H. G. Lyon, United States Army, was also obtained in 1912. Like most of the really valuable collections of Filipino weapons and armor, this collection contains representative specimens of Moro handicraft, including some ceremonial beheading blades, "talibong," also a brass cannon, "lantaca."

In 1915 a collection was obtained as a loan from the Misses E. H. and S. S. Metcalf. The collection includes Bagobo material, consisting of bows wound with rattan, arrows and decorated quivers, spears with bamboo shaft, figured brass ferrule and wooded sheath; other spear shafts are of palm or hardwood wound with iron and shod with brass and silver, on which braided ferrules of rattan alternate with ferrules of brass or iron; wood shields set with tufts of hair and having carved textile patterns; also oblong and carved shields; beheading swords, "talibong," with engraved blades; bolos with bifurcate, beaded, and carved scabbards; work bolos with basketry scabbard, krisses and daggers with inset, straight, or wavy blades; kampilans with and without cloth pendants; woman's knives with scabbards inlaid with appliqué ornamentation.

In 1915 Maj. and Mrs. Edgar Russel presented a collection that was obtained in 1898–1901. In 1916 Mrs. James F. Bates presented a collection of blades and daggers especially valuable in that the influence of European adaptation in detail of design is especially noticeable; included are also arm daggers, "jamdhar," from India having floriated inlay in silver, Hindu blades, and Turkish swords. Mrs. James F. Courts also presented a collection of Moro and Tagalog weapons to the Museum in 1916.

Many collections of Filipino weapons date back to the time of the first invasion and occupation of the Philippine Islands by the United States troops. Such a collection is that of Douglas N. Starr, which was presented to the United States National Museum in 1919. Of special interest in this collection is an iron spearhead with ferrule probably of Chinese work; the spear has three long barbs upcurved at the tip and was used as a charm against "anitos" or spirits. Included are Moro carved and painted wooden shields with carved representations of a snake sighting a deer.

A collection made by Gen. Jacob Kline, United States Army, was presented to the National Museum by his daughters, Mrs. Thomas F. Dwyer and Miss Cathleen Cassel Kline, in 1920. The collection is designed to represent the arts and industries of the Philippine people and has a representative weapon section embracing bows and arrows, spears, blowguns, a spring gun of bamboo, cross bow, chopping and cutting knives and blades, krisses, and daggers.

A recent Museum accession is a collection from Miss Isobel H. Lenman, acquired in 1921, comprising Kalinga and Igorot spears, head axes, and Moro krisses and daggers. Another recent accession is a collection from Arthur R. Fergusson, presented in 1922. In this collection from the islands of Cebu and Samar the influence of Hindu design is seen on a brass pike head and on a woman's knife and sheath. European influence may be noted on a sword having a brass guard with double curve fastened as on a common saber. Swords from the southern islands have inlaid animal-head carvings on wooden handle in Javanese style, others have handle covered with braided rattan. Short swords from the island of Negros, Visayan Islands, have sword handles inset with embossed silver, others have handles sheathed with silver repoussé; kampilans are ornamented with tufts of hair and with massive wooden guard. The pronged Igorot shields in the collection are carved and ornamented with black painted designs, while the Kalinga and Moro wooden shields are edged with tufts of human hair and are ornamented with carved surface patterns inlaid with lime.

The collection of Col. George C. Shaw, United States Army, was presented in 1922. The collection is noteworthy in that it was accumulated during the punitive expedition under Capt. J. J. Pershing against Lake Lanao Moros in Mindanao in 1903. Included are some Moro war gongs, 23 inches in diameter, of hammered brass with hemispherical boss and painted star design in center. Moro spears from the Lake Lanao region have leaf-shaped blades and shafts overlaid with bands of brass, braided rattan, or iron. Moro krisses, kampilans, barongs, and parangs of various descriptions are included. Other weapons in the collection are barongs with wooden scabbards, beheading knives of various descriptions, head axes from northern Luzon, and other miscellaneous war paraphernalia.

Another collection of Filipino weapons was presented to the Museum by Capt. W. C. Warmsley, assistant surgeon, United States Volunteers. The collection was acquired while Captain Warmsley was on duty in the Philippines and includes a good assortment of Moro blades and daggers, shields of various descriptions, and bows, arrows, and quivers from the tribes of northern Luzon.

Anthony J. Gies, chief inspector of streets and drainage, Manila, brought a large collection of ethnological, historical, and technological objects to the United States in May, 1900, from which a selection was purchased by the Museum for the Pan American Exposition.

Representative collections of primitive weapons employed by the Negritos of Luzon and of the southern islands were made from time to time by various Army officers and others employed in the Philippine service. Such collections were presented to the Museum by E. H. Hammond, Lieut. W. F. H. Godson, John H. Ford, and others. The collection of E. H. Hammond includes several valuable wooden shields such as were employed by the Remontados or mountaineers from the borders of the Provinces of Iloilo, Antique, and Capiz in the Visayan Islands.

As early as 1904 Capt. Edwin Y. Miller, then governor of the Province of Paragua, Island of Palawan, began collecting type weapons belonging to the pagan hybrid Malay and Negrito Batak of the interior of Palawan. This collection was presented to the Museum in part by Captain Miller himself and in part by his wife, Mrs. Florence G. Miller, in 1923. The collection is the best and most complete unit of Palawan Batak weapons in existence.

Small but excellent collections from the Moro and other tribes of the southern and the Visayan Islands were presented to the Museum by numerous different individuals. A collection of Samal Moro weapons given to President Theodore Roosevelt was deposited in the Museum by Maj. Archie Butt, United States Army. Collections from the Moro of Sulu Archipelago and from Mindanao were acquired through D. W. Oyster, Wilbur J. Carr, Gen. R. D. Potts, United States Army, Capt. T. W. Darrah, United States Army, Lieut. Col. D. W. Hand, Maj. W. T. Johnston, United States Army, James M. Sheridan, D. B. Mackie, Rev. David Barr, Maj. E. L. Hawkes, W. Huse Chapman, J. M. Harkins, Dr. E. R. Hodge, United States Army, of the Army Medical Museum, and Arthur R. Fergusson, who also presented a collection of ancient Visayan blades having grotesquely carved wooden pommel resembling the grotesque human figurine totemic "wyang" carvings on Javanese parang handles.

Most of the weapon collections in the United States National Museum from the Philippine Islands are recent accessions. They contain many individual specimens not represented elsewhere in museum collections. Examples of such are the ancient war clubs which belong to a culture antedating the iron age in the Philippines; also, the arrow and spear types from the southern islands showing Melanesian influence. Individual weapon collections are in part unique in that they portray the design perfected in some one locality and

in part representing the more generalized types of design and ornamentation representative of entire areas and culture types within the Philippine Archipelago, and in part inclusive of Bornean, Celebes, and Javanese types.

Objectives.—The primary objective of this handbook to the armor and weapons from the Philippine Islands now in the United States National Museum is to describe various weapon types that have preserved in metal, wood, horn, and bone traces of the material culture of the several waves of civilization that have reached the Philippines in the past. Tribal groups and nationalities manifest in their weapon production and types of body armor and shields a nearness to or a remoteness from foreign culture influences.

No one group of the Filipino people has retained exclusively any one type of civilization or material culture, but has incorporated elements that survived from a primitive Indonesian culture stratum or which were introduced by the Malays from western Malaysia. Other tribes in the Philippines have noticeably borrowed from the Negrito, the primitive aboriginal ethnic stock. Thus, the Bagobo, a non-Mohammedan Malay tribe of central Mindanao, employ the bow and arrow, which is a characteristic Negrito weapon, while the Batak of Palawan, a Malay-Negrito tribal group, have developed the use of the blowgun, a typical Malay weapon, and the Negritos of the Zambales Mountains and of the Luzon east coast use the Malay shield. Wherever a Filipino group employs the fine iron and steel blades that have come to be recognized as characteristic of the craftsmanship of the Mohammedanized Moros, the decorative design on blade and the blade form are invariably of Hindu or Arabic design. Firearms such as the brass cannon "lantacas" which were in use by the Moros at the time of the earliest Spanish explorations in the Philippines had their origin in the far-off western world; knowledge of their production having been spread by civilization emanating from India and Arabia. The Tagalog and other Christianized Filipino nationalities of Luzon and the Visayan islands employ hand weapons for cutting and slashing which show Spanish influence in design especially of scabbard, grip, and guard. The so-called wild tribes of the northern interior of Luzon, although belonging to the earlier primitive Indonesian ethnic stock physically, have accepted the iron culture of the later Malay immigrant though retaining their primitive warlike customs of ceremonial head-hunting and guerrilla warfare.

The second objective of this catalogue of Philippine weapons of offense and defense is to describe the typical originality of form, the skill displayed in weapon manufacture, and the beauty of ornamental weapon patterns produced in the islands but characteristic

of the localities in which they are made and used. Some of the weapon types originating in a locality are not found elsewhere, while others are related to various foreign cultures and represent more generalized weapon forms.

A third objective is to make accessible to the public a catalogue of the weapons in the United States National Museum from the Philippine Islands to which reference may be taken in the classification, identification, and appreciation of the many excellent Philippine weapon collections throughout the United States.

DEVELOPMENT OF PHILIPPINE WEAPONS AND TRIBAL CULTURES

Early differentiation of primitive weapons and implements.—Cutting instruments early became differentiated into weapons and implements. No difference existed originally between implements and weapons. The digging stick is also the first weapon form. A heavy stick is also a club. A club with a knob becomes a still more effective weapon when sharpened to an edge on one of its surfaces, thus becoming an ax. Point the stick and it becomes a spear for combat at a distance. If the stick is short it becomes a dagger suitable for defensive and offensive use at close quarters. Flatten the stick and prolong its sharpened edge to the full length of the stick and it becomes a sword. A short flat stick with sharpened lateral edge becomes a knife. If the stick with bulbous end is edged transversely to its longitudinal axis, the ax becomes a hoe. The stick which has acquired a knife-blade edge is also a useful household implement. The same quality of use applies to objects of stone and to the metals, such as copper and iron. Among primitive peoples sharp-edged iron knives used in the household, in hunting, and in the handicrafts are also weapons of combat.

Specialization of pointed, edged, and striking weapons through the introduction of metals.—Only among those tribes more skilled as ironsmiths and among tribes which have repeatedly been subjected to foreign culture influence is there an appreciable differentiation in weapon types. The iron culture of Malaysia, more particularly of the Philippine Islands, comes under such a classification. Here, again, it is among those Filipino nationalities whose Mohammedanization is most marked that weapons assume their most varied and beautiful forms.

In the Proceedings of the United States National Museum (vol. 60, p. 20), a classification of weapons is given which is also applicable in this study of Philippine weapon and armor types. Omitting all employment of fire, smoke, poison, etc., to destroy life, the weapons of mankind are of three kinds—pointed weapons to pierce some vital part, edged weapons to cut the muscular tissues and even to chop the

bony structure, and striking weapons to stun, to bruise, and to break the bones.

They are (1) held in the hand; (2) attached to the end of a shaft; (3) hurled from the hand, as a javelin; (4) shot from a bow, arbalest, catapult, or gun; or (5) thrown from a sling, throwing stick, or balista.

Natural objects, slightly modified, were the first cutting or slashing weapons. In one area they were shark's teeth fastened on a handle; in another, silicious stones, used singly or on shafts, did the murderous work. Weapons of this class, however, were crude until the age of metals, when they assumed the first rank.

Hand weapons for piercing or stabbing, as for instance, daggers, which undergo various modifications, according to the grade of culture, the materials at hand, and the taste or idiosyncrasies of peoples. The first forms were pointed spines of vegetal or animal substances, either in their natural state or ground to a point. Metal weapons of this class for merely piercing are scarce. The function of cutting as well is easily added by making the blade triangular and sharpening the sides. The effect is then to pierce a vital organ or to sever a blood vessel. The bayonet is the modern expression of the hand weapon for piercing added to a musket or rifle.

Cut-and-thrust weapons, with hilts, include sabers, swords, rapiers, claymores, and their congeners. When fastened to the end of a shaft or handle, they are halberts or Japanese long swords; when thrown from the hand, they branch out into the large class of African trumbases and throwing irons. The saber has but one edge, the back being thick and strong. The sword is the perfection of this type of weapons, having two edges and a point. The saber cuts flesh and blood vessels, and in its modern form with its dull edge also makes ugly bruises, and so comes into the category of bruising weapons. The sword is for piercing, cutting, and even for breaking bones, and in its largest form is used with both hands. Burton regards it as the most exalted weapon in single combats.

Piercing weapons are either held in the hand or attached to a shaft. They are thrown from the hand, slung from the throwing stick, or moved by elasticity. Those moved by elasticity may be discharged from a blowtube, from a bow, from an arbalest, or from a firearm. The progress of invention in the piercing projectile is marked in the perfecting, firstly, of the projectile itself; secondly, of the elastic device or projector; and, thirdly, of the mechanism or release.

The bow is an elastic rod or stave which is bent, the two ends being united by a tough string. A bolt is shot from this apparatus, either to pierce, to cut, or to bruise. The first bows were unmodified staves; the latest were made up of several pieces of differ-

ent kinds of wood glued together and lined on the back with sinew or tough rawhide. The inner layer supplies the element of rigidity; the outer layer or back that of elasticity, and these two layers are held firmly in place by side pieces glued on. The limit of the simple bow is that of the muscular effort required to bend it; but if the bow be fastened to a stick, as in the bow gun or arbalest, then mechanical devices can be used to bend it, so that its rigidity and efficiency may be increased immensely; in fact, the different varieties of arbalest receive their name from the methods of bending the bow.

Methods of classification and types of Philippine weapons of offense and defense.—Weapons of the Philippine Islands may be classified as to materials employed in their construction, whether made of horn, bone, wood, canes, copper, brass, bronze, iron, or steel; they may be further classified as to the method of their employment in hand-to-hand combat or for projecting at a distance; or, again, with regard to the nature of the cutting edge and the general adaptability of the weapon for cutting and slashing or for thrusting; and, finally, with regard to the form of the weapon and its ornamental features. Weapons employed by the various Filipino tribal groups vary with the degree of influence exercised on them by intrusive ethnic elements and cultures, with the skill in metal work attained by the different tribes, and in their accessibility to supplies of metal ore. Generally speaking, the degree of excellence attained by any one tribe in the metal handicrafts and more particularly in the forging of weapons is at the same time the measure of its acculturation to Hindu and more particularly to Mohammedan metal crafts brought from the Asiatic mainland.

No archeological evidence pointing to the occupancy of the Philippine Islands before the introduction of iron has ever been found, although weapons formed from bamboo, wood, stone, and iron are coextensively employed. Curiously enough, one of the few stone artifacts found in use by the Spanish conquerors was a crude granite crucible for reducing gold ore and quartz which the early Spanish adopted and employed in their mining operations. The possibility that the Philippines were occupied by Negritos and by primitive Indonesians before the age of iron or even copper is not remote. If such occupation occurred, there is every possibility that even then there was no stone age, as it is understood to have transpired elsewhere. The tropical flora of the East Indies furnishes materials more easily worked and more adaptable than is stone. Bamboo furnished the material for all of the weapons and implements required. A shell or stone that might be used but once could be employed in shaping the bamboo spear or arrow shaft and still not be representative of a stone age in its true sense.

Weapons of the Philippine Islands are remarkable for their variety of perfected design; they illustrate the employment of a wide variety of materials fashioned in an artistic and effective manner; they are further remarkable for the skill displayed in their manufacture, in the decorative art displayed, and in their use as insignia. Contacts with peoples indicated through weapon types originating elsewhere are illustrated; also examples of the great ingenuity and skill in ornamental patterns introduced either locally or throughout wide areas.

Weapons of offense embrace clubs of various shapes, some of them edged; slung shots made by attaching a bag woven of abaca (manila hemp) fiber and loaded with an iron ball or poisoned stones to a looped rope; spears, lances, and harpoons with bamboo, steel, or iron blades in great variety of forms and with shafts of hardwood and bamboo wrapped with rattan or shod with figured iron or brass; bows of wrapped or plain palm wood or bamboo; arrows with reed shafts, palm wood foreshafts, and plain or barbed metal, bamboo, or palm wood points. Sword blades and knives of iron and steel for slashing and stabbing are often laminated or are inlaid with a soft metal, and have horn, ivory, or wood handles decorated, carved, and beautifully made; edged weapons of the cutting and slashing type have heavy backs to supply weight, and are often supplied with acute pointed tips for piercing and thrusting, or, again, are abruptly truncated at the distal end like a scimitar for chopping. The single tube blowgun reaches its most decorative form among the Palawan Batak, while other forms of offensive weapons had a wide distribution, such as the formerly prevalent crossbow. The production of brass and bronze firearms and culverins was limited to groups and nationalities under the influence of Mohammedan culture, although the employment of brass ornamentally has been acquired by many of the nationalities that remained pagan.

Weapons of defense include shields of three kinds, the circular, the oblong, and the pronged concavo-convex types. Shields are for the most part carved from a single block of wood and are used as targets for parrying, and protection; they are also woven from rattan splints or are made of hides. Chevaux de frise, caltraps, and path splinters are set up in the paths and approaches to villages. Body armor of chain and plate brass, of horn, leather, and of woven fiber, and helmets of hides, various fibers, brass, and tin are made by the southern island tribes after a native design or are copied from the Spanish armor of the fifteenth and sixteenth centuries or from ancient native Malayan models, such as are in vogue throughout Nias and other out of the way places in western Malaysia.

3021—26——2

Nonmetallic materials used in the construction of weapon parts.— In the development of primitive Filipino culture there are two outstanding plants that enter into the production of most of the necessities of daily life, namely, rattan and bamboo. Houses rest upon bamboo posts; most of the framework is of bamboo, while floors and walls consist of thin bamboo tubing. Defensive walls and fences are fashioned from the same material; split pales are sharpened at the top and are woven firmly together into an impenetrable barrier. Knives and saws, containers of various types and sizes, and quivers for arrows and for blowgun darts, all are shaped from bamboo along with innumerable other articles of daily use.

A sharpened length of bamboo is a natural spear, and one of its earliest forms. A great variety of basketry traps and receptacles represents one type of articles fashioned from bamboo, while at the other extreme in usage are the numerous tubular weapons ranging from the blowgun to the less commonly constructed small cannon.

The importance of rattan "bejuco" as a tying material and as a wrapper on scabbard, parang handle, and on spear shaft and other weapons and objects of warfare, the hunt, and other phases of their daily life permit the natives to dispense entirely with such objects as iron or wooden nails. Its qualities of flexibility and tensile strength are well known.

Bamboos are tall bushy grasses having woody stems or culms which are more or less hollow and are provided with transverse solid joints or septums. At maturity, or after the first period of rapid growth has passed, the stems become hardened at the rind by a deposit of hard, brittle, silicious matter. The bamboo is a member of the family of grasses (*Gramineae*), two of the most widely distributed varieties being the thick-walled *Bambusa blumeana* and the thin-walled dwarf variety, *caña boho* (*Bambusa lumampao*). This latter variety occurs mostly in the forested regions, and is probably more often used in the production of arrow shafts than is the larger variety, though there are many examples of arrows formed from this variety in the Museum collections. In the making of bamboo scabbards, sheaths for spears and daggers, and spear shafts the larger variety is employed exclusively.

Palm fibers and palm woods abound in the Phillippines. Varieties useful in the production of weapons are such well-known palms as the betel-nut palm (*Areca catechu*), nipa palm (*Nipa fructicans*), buri palm (*Corypha umbraculifera*), and the coconut palm (*Cocos nucifera*). These varieties are useful in the preparation of spear shafts, arrow foreshafts, and in the hafting of parangs and daggers. The fiber, or coir, of the coconut, which is found in the husk or outer pericarp surrounding the nut, is employed together

with the bark of forest plants, such as the bejucos or rattans, in the production of wrapping cord for fastening and reinforcing the bow cords, arrow points, sword handles, and elsewhere in weapon production.

Structural fibers, such as that of the abaca (*Musa textilis*), a species of banana which grows in those sections of the Philippines that have no dry season and in districts lying below the typhoon belt, and the surface fibers, such as kapok or tree cotton and coir from the husk of the coconut, are useful to the native in weapon manufacture.

Animal products such as bone and dugong or sea cow ivory are used in the production of the finely carved parang handles and arrow heads. Other animal products used in a similar way are horn of deer or water buffalo (carabao). To a much less extent is there any employment of hides or skins of animals in the production of helmets, shields, or sections of plate armor in the coats of mail which are occasionally made by the Moro armorer. The use of sinew as bow cord is unknown to the native Filipino weapon maker. Cotton cloth is occasionally used in the wrapping of ornamental parang handles, in the production of shields, or in the miscellaneous wrappings on weapon shaftments. No use is ever made of cotton or wool in the production of padded coats of mail or in cloth helmets, padded armor being entirely foreign to the weapon complex of the Malay. Human hair and the hair of horses is commonly used in an ornamental design on the handles of the so-called hairy kampilan of the Moro, also as an ornamental fringe on the lateral edges of the Moro shield. No doubt the use of human hair in wrappings of various kinds was formerly more widely diffused than at present, due to the decline in ceremonialism formerly associated with head hunting.

In addition to the silicious hard rind of the bamboo and the tough flexible fiber of the rattans, there are three kinds of wood used in the making of native weapons. These types of wood are classed with regard to their hardness and the degree of resistance offered both to the inroads of pests, such as the *ani* or white "ants," and in production of weapons and the various weapon parts. The first group consists of the moderately heavy woods comparable to the harder pines. They are of the dipterocarp type, including the well-known red and white lauans and the tanguile. The harder woods comparable to the mahoganies have a fine grain and take on a high polish. Woods of this class are the molave, the narra, and ipil. The third group includes the ebony-like camagon which runs from black to brown and comes from the mabolo tree. The most common use made of these woods is in the fine and ornately carved sword handles, but to a lesser degree wood is also employed in the making of shaftments for arrows

and spears and in shields; clubs and other weapons of various kinds of wood are more rare.

Methods of metal production and metal working.—A classification of the tribal groups of the Philippines based upon the amount of iron and other metals employed would include with the Negritos several of the pagan tribes that do not make their own iron implements or weapons but acquire them in trade with the more highly cultured peoples. Second, the metal casting tribes of northern Luzon of head-hunting proclivities, such as the Bontok-Igorot, the Kalinga, and the Tinggian, as well as the Bagobo, the Mandaya, and the Mindanao pagan tribes, all of which are able to cast brass metal objects and to forge iron. Limitation in the supply of metal often compels them to have recourse to their more primitive and ancient weapons, so that iron and bamboo spearheads may be employed in the same community.

The mining of iron ore in the Philippines was carried on for centuries in the Angat Mountain region in the Province of Bulacan in the central part of Luzon, but nowhere has a plentiful supply of the worked metal been found. The first iron implements or weapons were introduced from Borneo, where the industry is much older and where there is a sufficient supply of ore. Later, the knowledge of working iron was imported into the Philippines along with a supply of the raw material.

The method employed in working iron is pretty much the same throughout the islands. The ingot of metal is heated in a fire of charcoal. Bellows consisting of several bamboo cylinders placed upright on the ground near the fire and worked with pistons supply air to the flame. A metal tube for carrying the air current to the fire is inserted at the bottom of the upright bamboo cylinder and projects at right angles to the nearby charcoal fire. The heated metal is beaten with heavy stone hammers and is held by crude iron tongs joined at one end. In the case of steel, a temper is secured by inserting the metal blade in water for rapid cooling. Even the finest swords of the Moro smiths are made by this method and with the aid of no other tools. In the Angat region of Bulacan the iron-ore deposits are very pure. Smelting is by charcoal and the finished product is made into plowshares and bolos, which are sold in the neighboring region and in Manila. Copper was formerly mined at Lepanto, in Bontok. Copper and brass seem to have been employed from the time of their introduction to the Philippine craftsman purely in an ornamental way. Iron, because of its qualities of hardness in an unalloyed state, was early preferred to copper and brass in the production of blades, while silver, gold, and copper had purely ornamental uses.

The statement often made regarding the excellence and superiority of Moro workmanship in iron and steel is only partially true. Many of the steel blades attributed to the Mohammedan Moro were probably made by Mohammedan smiths in Borneo where the iron industry is older and where the peculiar Malay weapons assume their most characteristic and beautiful shapes. It is true, however, that nowhere in the Philippines are there as many types of fine metal blades, richly ornamented with gold, silver, ivory, and brass as among the Moros of the Sulu Archipelago and in western Mindanao. The Pagan Bagobo dwelling farther east in Mindanao produces as beautiful brass work on iron spearheads and lances, and the central Luzon Tagalog of Bulacan secures as good a temper on his agricultural iron implements and work bolos as the Moro, while the head-hunter's steel ax of the northern central Luzon mountain area is an equally highly specialized weapon with as high a grade of steel blade and of as elaborate and beautiful an ornamental design on the poll as is true of Moro metal work.

In many cases it is difficult to ascertain whether blades are of steel or of iron. In general, most blades appear to be of steel whatever the source of this material may be, or whether it is recent commercial or from a native center of manufacture. The processes of metal working include all of those arts which go by the general name of hammering, casting, overlaying, inlaying, damascening, swaging, linking, chasing, embossing, carving, niello, and filigree work. For each process there is a craft with its own appliances, tools, and processes.

In the Ethnological Survey Publications (vol. 1, p. 125), Dr. E. A. Jenks relates in detail the operations connected with the production of metal weapons at Baliwang, Bontoc, northern Luzon.

> Baliwang has four smithies, in each of which two or three men labor, each man in a smithy performing a separate part of the work. One operates the bellows, another feeds the fire and does the heavy striking during the initial part of the work, and the other—the real blade maker, the artist—directs all the labor and performs the finer and finishing parts of the blade production.
>
> The smithies are about 12 feet square without side walls. They have a grass roof sloping to within 3 feet of the earth, enlarging the shaded area to near 20 feet square. Near one side of the room is the bellows, called "op-op," consisting of two vertical, parallel wooden tubes about 5 feet long and 10 inches in diameter, standing side by side. Each tube has a piston or plunger called "dot-dot"; the packing ring of the piston is of wood covered with chicken feathers making it slightly flexible at the rim, so it fits snugly in the tube. The lower end of the bellows tubes rests in the earth, 4 inches above which a small bamboo tube leads the compressed air to the fireplace from each bellows tube. These small tubes, called "to-bong," end near an opening through a brick at the back of the fire, and the air forced through them passes on through the brick to the burning charcoal. The outer end of the "to-bong" is cut at an angle, and as the tubes end outside the opening in the brick, the air

inbreathed by the bellows, as the plungers are raised, is drawn from back of the fireplace, thus the fire is not disturbed.

The bellows described by Doctor Jenks is typical of the Malaysian fire bellows which is distributed throughout a wide area in Siam, Assam, Salwin, Sumatra, Java, and even in far-off Madagascar.

Ethnic contacts and culture traditions as influencing weapon types.—It is questionable whether the Filipino peoples first received their knowledge of the uses and processes of manufacture of brass and bronze from China or from India. Undoubtedly knowledge of trade articles of brass and bronze in the Philippines antedates that of iron. The little archeological investigation that has been done has determined this. Corroborative evidence lies in the knowledge of metal craft in brass possessed by those tribes, among whom the working in iron and steel is undeveloped. Chinese traders carried on an extensive trade in bronze objects, such as gongs, with most of the Filipino tribes at an early date. Such gongs are still treasured as musical instruments by many of the tribes. The fact that a similar musical instrument has long been employed in Siam, in Java, and in other islands would seem to indicate that the employment of brass and bronze is of greater antiquity in the Hinduized regions of Malaysia than among those peoples merely enjoying trade relations with China. The Filipino term for the musical gong is "gansa" or "agong" and is closely related to the Javanese terms "gamelan" or "anklang," also, however, to our word "gong." It is probable that Hindu culture which overspread the southern islands of the Philippine archipelago familiarized the natives with the uses of brass, but that lack of the raw material from which to produce articles such as musical instruments, weapons, and ornaments of various kinds caused a brisk trade in bronze and brass to spring up with the itinerant Chinese trader.

Brass and bronze are both metallic alloys of copper; brass requiring the addition of zinc to the copper while bronze is an alloy of copper and tin. The process employed in the manufacture of articles from these alloys is known as the cire perdue. A model of the article to be produced is first made of beeswax and surrounded with a clay mould. The whole is then subjected to heat, when the beeswax melts and is allowed to run off. Molten brass is then poured into the clay mould, allowed to harden, and the clay mould is broken away. Often a patterned design in softer metal such as copper or gold is inlaid in ornamental brass objects or in the finer steel blades of the Moro.

The softness of gold as well as its presence in placers, rock strata, and in river gravels enabled the Filipino to work gold and to develop a native industry without foreign influence. Gold thus manufactured by the Filipino native into various ornamental ob-

jects required neither smelting nor casting because of its softness and freedom from other ingredients when mined. The use of gold metal in the production of ornamental objects or as an inlay in the harder imported metals is distinctly a Filipino development. Primitive Malay tribes of northern Luzon still mine gold and trade it to the Christianized plains tribes for necessary industrial and household articles.

In the Proceedings of the National Academy of Science (vol. 2, p. 127), Dr. Walter Hough discusses at length the origin of metallurgy in iron and observes that primitive man had seen metallic iron derived from meteorites but that its occurrence was sporadic and limited.

Heavy and lustrous hematite ores were also widely used for implements and ornaments. When and in what locality iron began to be smelted is unknown, but, as has been stated, it is the logical successor to the advanced technic of the metallurgy of bronze. Primitive iron working may still be observed in Africa and has been described in India. African ore is an oxide comparatively very easy of reduction and ore beds are of general occurrence. The smelter consists of a basin-shaped depression in the ground beaten down hard, and leading to the center is a clay tuyere with which the rude bellows are connected. The ore is heaped with charcoal in this depression and in the midst lighted coals are placed and covered over. The bellows are started and after a time the ore is reduced to a fluxed mass in which small pellets of iron are found. The mass is pounded up and the iron sorted out to be hammered into larger pieces by a second process. This was essentially the method pursued in India. Only limited amounts of metal were secured. Casting of iron was unknown in Africa. The knowledge of smelting is quite diffused in Africa, so that there are no chief centers of manufacture and distribution, although some tribes are famed as blacksmiths and a few tribes depend on alien artificers for their iron utensils. The smelting of iron ore is impossible without forced draft. The bellows therefore is a device of great interest and importance. The history of draft-producing devices embraces the hand fan, the tube for blowing, the air bag, in which the air is captured and forced out by pressure through a tube, the double air bag to promote a steady stream of air, the double air bag worked by rods, in which a valve appears, the double plunger bellows, the piston bellows, the folding bellows, with organ valve used by blacksmiths before the invention of the fan blower, and the fan blower, which brings back the primitive hand fan much improved.

The most marked types, the complete knowledge of which would cast much light on the history of the western and eastern foci of metallurgy, are the air bags and the piston blower, the former belonging to the Europe-Africa province and the latter to Malaysia.

An interesting survey is presented of the state of metallurgic art in the various world areas. It shows that the Pacific islands, most of the Americas, Australia, and much of Asia are in the premetallic stage; Malaysia is in the beginning of the metallic age by acculturation, the first demand being weapons; native Africa is advanced in iron metallurgy, using two metals; civilized (Mediterranean) Africa advanced in the use of metals; Europe (Mediterranean) shows early development and use of five metals. There are

four great ancient foci of metallurgic art—southern Europe, northern Africa, western Asia, and eastern Asia. The latter is of doubtful origin and affiliation, but the other foci were connected.

In India iron ore was as abundant as the supply of copper was lacking. In very ancient times, therefore, knowledge of metallurgy in iron must have been considerable. The iron pillar at Delhi, "Kutab Minar," from which is derived our term "minaret," is 50 feet high and 16 inches in diameter and dates back to almost a thousand years B. C. An interesting observance is the survival of the primitive Indian methods of iron and steel production in the island of Ceylon. For the manufacture of iron the furnace is located under a thatched roof of an open shed. The furnace parts consist of a bellows, a furnace well, and a wall of sticks and mud to protect the bellows operator from the furnace fire. Bellows consist of two hollow wooden logs partially buried in the ground. A piece of deerskin is stretched over each log. A cord is then attached to each skin near a hole placed at the center. The other end of the cord is attached to a flexed stave which is embedded in the ground at one end. At the end of each log is a pipe of small caliber which carries the air blast into the furnace. The operator now takes his position on a near-by seat, grasps a bar for support, and alternately places one foot on each deerskin over the centrally located hole, thus obtaining a primitive valve action and supplying a continuous blast. The previously roasted ore is placed in the furnace in layers alternating with layers of charcoal. When the bloom is satisfactory it is removed from the furnace with long tongs of green wood.

Methods employed in the production of steel are more complicated and refined, the bellows and protective wall remaining the same. The hearth or furnace well consists of a semicircular depression filled with charcoal. A low clay wall surrounds this hearth. Clay tubes, each 8 inches long and 2 inches wide on the inside but having walls of several inches in diameter, are filled with ingots of iron and chips of wood, in the proportion of 12½ ounces of iron to 5 ounces of wood. The tube is then entirely closed except for several small holes that allow the gas to escape. The clay tubes are then buried in the charcoal and the operations begin. After the gases have burned from the wood chips the blast of air is increased. The fire is then allowed to cool, the clay tube is broken open, and the steel bar removed.

In modified form the primitive bellows and furnace of southern Asia found its way throughout an area extending from Madagascar to the Philippines, the center of diffusion being unquestionably India. In northeastern Asia the age of iron dates back to the pre-Christian era in China, while the stone burial dolmens of Japan as far back as the second century B. C. contain iron swords and spears.

Methods of iron production, however, and the quality of the output of the furnaces which is in part cast iron and in part a lump of malleable iron, also the type of furnace construction lead to the conclusion that China and, later, Japan developed their knowledge of iron production along independent lines. Many clear-cut distinctions in metal lore, in the artistic embellishment of weapons, and in their functions may be drawn between the metallurgical centers of southern Asia, including the Philippines, and northern and eastern Asia, including China and Japan, as will be pointed out later.

The Philippine Islands have been influenced by Asiatic migrations and culture probably since the beginning of the first centuries of our era. Subjected in turn to culture influence from Indo-China, Sumatra, and Borneo, and to the Javanese Empire of Madjapahit, they were at the same time subjected to the penetrating culture influences of Hinduism, followed in turn by that of the Chinese and the Japanese. Then the subjection of the southern and southeastern sections of the Philippines to Islam through the agency of the Malayan missionaries was effected not more than two hundred years before the conquest of the islands by the Catholic Spanish type of European culture was begun. The rule of Spain in the Philippines was gradually extended, to succumb for a brief period of two years to the control of the British-Indian Army, and later to be entirely overthrown by the force of arms of the western world, the United States. That each of these empires and culture types left traces is clearly evidenced by the racial types at present inhabiting the islands, by prevalent culture distribution, and by the existing ethnic stratification.

The native population: Ethnic stocks and ethnic stratification.— In most discussions regarding native culture traits of the Filipino people emphasis is placed on the borrowings from the Asiatic mainland. Yet it would be difficult to name a people possessing as much ingenuity and inventiveness within the limits of its geographic possibilities. A land that is devoid of metal ore for the most part and whose people must of necessity import the great bulk of their metal could hardly be expected to develop a greater originality in metal work than the adjoining lands from which their supplies were obtained. Nevertheless, the metal work of the pagan and Mohammedan Filipino in brass and iron has come to have a much wider reputation for beauty of design and artistic workmanship than that of any other East Indian people. In so far as loomless handicrafts and basketry enter in the manufacture of shields, scabbards, and armor the excellence of their skill is remarkable.

Broadly speaking, there are three ethnic stocks represented in the population of the Philippine Islands—the Negrito, the Indonesian,

and the Malay. Similarly, one may segregate three cultural strata existing side by side in the islands. Although one of the physical types may have borrowed elements of its culture from the other, and although one may have borrowed from the Asiatic mainland to a greater extent than either of the other two stocks, it is on the whole correct to ascribe a distinct culture to each of the three stocks.

Negritos.—The Negrito is usually referred to as the earliest immigrant to the Philippines. The reasons cited in making this assertion are geographical, cultural, and racial. The Philippine Negrito is a member of a race that has everywhere been pushed back into the forested uplands of the continent or island group in which it dwells. The first census of the Philippine Islands classified these backward people as either "Igorot" or as "Bukidnon" (hill people). Each of these terms is now applied to a separate and distinct tribe; the first, "Igorot," to an Indonesian tribe occupying a limited area in northern Luzon, and the second, the "Bukidnon," to a pagan Malay tribe living in the island of Mindanao. The Negrito lives in widely scattered regions in Luzon, Mindanao, Palawan, and other islands. The Tagalog, dwelling in the central plains of Luzon, speak of the Luzon Negrito as the "aeta," "eta," or "atta." The Palawan Island Negrito hybrid is called "Batak." This term should not be confused with the "Battak" of north Sumatra. Gathered here and there in limited numbers in the mountainous areas of southern and eastern Luzon, in Samar, Negros, Palawan, Panay, and Mindanao there exist remnants of the same Negrito stock.

If one includes the Negrito-Malay hybrid element which is for the most part usually reckoned a part of the non-Negrito stock often referred to as the "remontados" (outlaws), together with all tribes possessing Negrito blood, the total number living in the Philippines scarcely exceeds 30,000. Characteristic of the Negrito is his diminutive size, his frizzy hair, his black skin color, and his meager culture. He may be considered as a true pygmy with an average height of less than 156 centimeters (5 feet). Similar Negrito types are present in some of the other sections of Malaysia, notably in the interior of the Malay Peninsula and in the Andaman Islands. They are also present to the south in the interior of the island of New Guinea. The racial affiliations of the Negrito lie with the black peoples of Melanesia and Africa, although he is decidedly broad headed, which the African Negro is not.*

Indonesians, Mohammedan, Christian, and Pagan Malayan stocks.—The majority of the non-Negrito population belongs to two closely related brown-skinned stocks which are known, respectively, as the Indonesians and Malays. Differences existing between the two stocks seem to be mostly cultural. Physical distinctions, however, exist. The Indonesian is shorter of stature, has a longer head

form, and a broader nose. The Malay, by far the more numerous, has an average stature of 157 to 164 centimeters (5 feet to 5 feet 3 inches), and a head form with index varying from 80 to 85. The Indonesian is more sturdily built, has shorter legs, and a more prominent bony framework. The two types are alike in that they resemble the generalized Mongoloid strain in the coarse, lanky structure of the hair, in skin color, in the round head form, and in facial features. Most of the population of the Philippine Islands is of the Malay type. It includes all of the Christian tribes of Luzon and the Visayan Islands and the Moro of Mindanao and Jolo as well. The Indonesian stock includes most of the more primitive and non-Christian tribes of Luzon and of the southern islands.

One explanation of the separate physical stocks existing in the Philippines lies in the recognition of the fact that their migration to the Philippines must have occurred at widely removed dates. The Negritos probably came first, the Indonesians later, and the Malay at a still later date and presumably in superior numbers. In some of the other large islands of Indonesia and Malaysia similar conditions exist. It is also striking that the same juxtaposition of habitat of these same three stocks occurs in Java, Sumatra, and in Borneo, where the aboriginal Negrito has been deprived of most of his territory and pushed into the most widely scattered and inaccessible regions, surrounded by the longer-headed and brown-skinned Indonesians, who also dwell in the mountainous interior, while the more highly civilized Malay occupies the coast and the interior river valleys.

Local modifications of racial type may be observed at many places in the Philippines, so that in addition to the three main racial elements, admixture of European and oriental blood may be traced through the occupation of certain localities by representatives of those peoples in the past. Then, the hybridization of Negrito, Indonesian, and Malay occurs to a greater or less extent on the borders of their respective territories, so that the striking thing is the clear-cut division in culture which exists among the various elements in spite of racial admixture.

Historical culture contacts with Asia and Europe.—The Philippines have enjoyed accretions of population by way of immigration from the Asiatic mainland and the great semicontinental islands of the East Indies lying to the south, but have received many contributions of material culture as well. The history of the Philippine Islands does not extend beyond their discovery to the Spanish by Magellan in 1521, but this does not preclude a comparison of the various layers or strata of culture which have remained to the present day. Disregarding the recent educational

system introduced by Americans and all that pertains to their occupancy, the influence of the Spanish is almost everywhere apparent. The Spanish were in possession of the most populous and the richest territory for more than 300 years, and through their efforts probably nine-tenths of the population was Christianized and probably one-half of the population was educated to the extent that in most respects the Christian Filipino equaled the native Spaniard in accomplishments. Spanish influence constituted the veneer of the Filipino civilization, while the older Indonesian and Malay culture strata lay clearly indicated underneath several other layers of culture accomplishments.

In the southern islands of the Philippine Archipelago the Mohammedans had but recently established themselves two centuries before the arrival of the Spanish. Christianity had never been able to penetrate the Arabian Peninsula, and it required but the peculiar fanatical genius of Mohammed to send the armies of Arab horsemen, full of fanatical enthusiasm, to convert to their faith the vast population of the East at the point of the sword.

Animation of faith served to make of the Arabs the missionaries of western civilization. They became not only the greatest fighters of their time but the greatest sailors, geographers, and traders. Arab missionaries reached Malaysia by way of India, where they had settlements on the Malabar and the Coromandel coasts. The Malays at the time of their conversion to Mohammedanism were an insignificant people living on the island of Sumatra. Under the influence of the teachings of Mohammedan missionaries and their new faith they began as early as 1250 a conquest of their own which has made the Malay the most powerful people of the East Indies. These Mohammedanized Malays defeated the Dyaks, an Indonesian tribe, of western Borneo, and established themselves on the west coast of Borneo, from whence they carried on expeditions against the more primitive Malay and Indonesian tribes in the Philippines and elsewhere in the East Indies. At the time of the coming of the Spanish to the Philippines it was estimated that the total native population was one-half million inhabitants, not all of whom, however, were Mohammedanized. Outposts of the Mohammedan Malays were found established at Manila, in Luzon, and in the Visayan Islands of Mindoro, Lubang, and others.

The Mohammedan population of Mindanao and Jolo owes something certainly to this same Malay migration which founded the colony at Borneo. But the Magindanao and Illanon Moro seem to be largely descendants of primitive tribes, such as the Manobo and Tiruray, who were converted to Mohammedanism by Malay and Arab proselyters. The traditions of the Magindanao Moros ascribe their conversion to Kabunsuan, a native of Johore, the son of an Arab father and Malay mother. He came to Magindanao with a band of

followers, and from him the dattos of Magindanao trace their lineage. Kabunsuan, through his Arab father, is supposed to be descended from Mohammed, and so the dattos of Magindanao to the present day proudly believe that in their veins flows the blood of the prophet.[1]

A strange fact is to be noted in the simultaneous warfare of Spanish and Mohammedans both in the West, in Spain and in Morocco, and in the East, in the Philippines, where the Spanish again entered upon a warfare against their natural religious opponents, whom they had always called "Moors" or "Moros," so that the Malay Mohammedans received from them the same name "Moros."

Another peculiar historical incidence is that it is to religious impulse that the other great prehistoric culture influence in the Philippines is due. The great civilization developed in India by the Hindus is also responsible for the world religions, Braminism and Buddhism, that spread over Burma, Siam, and Java fifteen hundred years ago. Although temples and other great architectural ruins of Hindu civilization are not found elsewhere in the East Indies, it is clear from many sources that Hindu influence penetrated to far beyond the confines of the coast of Java. Many words in Tagalog dialect have a Sanskrit origin, the alphabet employed by the Filipinos at the time of their discovery to the Spanish was similar to that in use by the Hinduized Javanese. Dr. Pardo de Tavera writes "the words which Tagalog borrowed are those which signify intellectual acts, moral conceptions, emotions, superstitions, names of deities, of planets, of numerals of high number, of botany, of war and its results and consequences, and, finally of titles and dignities, some animals, instruments of industry, and the names of money." Inasmuch as the migration of the Malay to the Philippine Islands in great numbers was comparatively recent and under Mohammedan influence, it is probable that the Sanskrit words adopted into the Tagalog and other Filipino dialects were acquired from the Hindu at a much earlier date and before the migration to the Philippine Islands occurred. As the Hindus were not accustomed to making long maritime voyages, it is probable that Hindu culture was acquired piecemeal and that it passed from one island to its nearest island neighbor. There is no tribe in the Philippines, no matter how primitive and remote, in whose culture of to-day elements of Indian origin can not be traced.

One of the first authentic records of migration of the Malays who later spread over the entire region of Indonesia is their settlement of Singapore about the year 1160. First known from the region of Menangkabau, Sumatra, it required the stimulus of Islam to accel-

[1] A History of the Philippines, by David P. Barrows, p. 40.

erate their penetration of the most outlying sections of territory that later became known as Malaysia. From Sumatra to the Philippines, settlements by them are found in all of the insular groups lying between. Before the spread of the Malays, Hindus had acquired a foothold throughout most of the area. Some settlements were made probably as many as 2,000 years ago.

Borneo received many settlements of Hinduized Malays and probably of Hindus from Madjapahit in Java. Still later groups of Mohammedan Malays, such as the Bugin from the island of Celebes, founded settlements in Borneo. Chinese also arrived to work gold deposits and to mine precious stones which they found there. Consequently, for centuries the native population of portions of the island of Borneo was under the influence of foreign civilizations or at least was in contact with cultures of a higher order than its own.

One immigrant group, the Kayan, is cited by Hose and McDougall as arriving in Borneo about the beginning of the fourteenth century. These Malays landed near Sikudana and spread throughout central Borneo. The Dyaks of the interior were doubtless soon brought in contact with either the Hindu-Malay kingdoms of the coast or the Hinduized Kayan immigrants of the interior. Hose and McDougall relate in considerable detail the methods of iron working practiced by the Kayan such as were observed and imitated by the Dyaks, who in turn became the instructors of the Sulu Moros; northern Filipino tribes may well have secured their knowledge of iron working by a different route and from a different source.

> In any account of the arts and crafts of the Kayans, the working of iron claims the first place by reason of its high importance to them and on the skill and knowledge displayed by them in the difficult operations by which they produce their fine swords. The origin of their knowledge of iron and of the processes of smelting and forging remains hidden in mystery; but there can be little doubt that the Kayans were familiar with these processes before they entered Borneo, and it is probable that the Kayans were the first iron workers in Borneo, and that from them the other tribes have learnt the craft with varying measures of success. However this may be, the Kayans remain the most skillful ironworkers of the country, rivaled only in the production of serviceable sword blades by the Kenyahs.
>
> At the present day the Kayans, like all the other peoples, obtain their iron in the form of bars of iron and steel imported from Europe and distributed by the Chinese and Malay traders. But 30 years ago nearly all the iron worked by the tribes of the interior was from ore found in the river beds and possibly from masses of meteoric iron; and even at the present day the native ore is still smelted in the far interior, and swords made from it by the Kenyahs are still valued above all others.[2]

[2] The Pagan Tribes of Borneo, by C. W. Hose and McDougall, vol. 1, 1912, pp. 193–194.

The influence of still another people on the Philippines has to be considered, namely, the Chinese. There is no evidence that the Chinese affected permanently the intellectual life of the natives as did the Hindu, or that warlike institutions and weapons were introduced by them as by the Arabic Mohammedan. The Chinese, to the contrary, were traders. They must have carried on trade with various Malay settlements along the estuaries and bays of the Philippine coast many years before the arrival of Mohammedan missionaries. Three hundred years before the arrival of the Spanish, Chinese junks were regularly trading with the Philippine Islands. Archeological material recently unearthed by Dr. Carl E. Guthe, consisting of Chinese porcelain and pottery, substantiate the writings of a Chinese author, Chao Ju-kua, that the Chinese were acquainted with several of the Philippine Islands over 700 years ago. Chinese pottery jars of ancient manufacture and brass work, such as gongs, are still treasured by the Filipinos of the present day.

The Chinese people did not absorb the lore of the East regarding the use of iron and steel in the production of hand weapons for cutting and piercing. They were essentially an agricultural and trading people and sought their conquests in the field of commerce. There has always been something ludicrous in the linking up of Chinese culture traits to include the concept of hand-to-hand fighting and the manufacture of efficient fighting weapons. It is at this point that the Malay, the primitive as well as the Hinduized or Mohammedanized tribes, differ from the more nonresisting, fatalistic Chinese branch of the Mongolian race. It has, moreover, always been the southern Chinese provinces that erupted from time to time in rebellion or in piracy. The northern Chinese pursued warfare in a more dilettante fashion, having rules about fighting before lunch and the like. Even the more warlike Japanese did not develop fighting at close range but developed a craftsmanship in spears and halberds.

That contact with Chinese, Spanish, and Filipino was not entirely along peaceful, commercial lines is witnessed by the numerous combats instigated by Chinese pirates. The fighting craft and fighting implements of the early Chinese were remarkably inefficient, and weapons tending to be employed for show and for display consisted of ineffective blades of poor temper and form. They were usually burdened with considerable meaningless tinsel. Still, at times, remarkable expeditions and courageous projects were undertaken. The Chinese pirate Limahong, in his attack on Manila in 1574, relied on the strength of superior forces consisting of several thousand soldiers and 62 war junks. Leadership was in part exercised by a group of Japanese in his employ. It is said that at the crucial moment, the arrival of a Spanish detachment of 50

musketeers under the heroic Salcedo was instrumental in saving Manila. To the present day Moro mythology makes the waters and streams the abiding place of an evil dragon which bears the name of the Chinese pirate, Limahong.

Casting of brass cannon and use of firearms.—Brass cannon, the pride of the Moro soldier, were effective enough against other Filipino tribes not possessing firearms. Respect for the fighting qualities of the Moro was bestowed by the Spanish also on the small cannon or "lantacà" of native Moro manufacture. The Spanish, however, attributed them to Bornean or Chinese origin. These small culverins have a bore of from 1 to 2 inches. They were mounted on a single swivel bar and placed on the stockades, forts, and war praus ("prahus") of the Moro. As other Mohammedanized Malays of western Malaysia employed similar cannon and as the entire war complex of the Moro was derived from the Asiatic mainland through the agency of the Saracen missionary, it is probable that both the knowledge of making gunpowder and brass cannon did not come from China, as was believed by the early Spanish, but from Arabia by way of the island chain of western Malaysia.

At the arrival of the Spanish, natives of Borneo exchanged in trade with the Filipinos many articles which they themselves had obtained from China and India. Such merchandise included copper and tin, porcelain, dishes, gongs, bells, and cooking vessels of metal from China; cloth and blankets from India; and iron lances, blades, and knives, which were derived either from India or had been fashioned by the natives of Borneo. Slaves, beeswax, gold, shells, and cloth were received from the Filipino in exchange. Junks from Siam trading with the Visayan Islands were encountered by the Spanish. Malays sent their war praus to trade with islands as remote as northern Luzon. Legaspi while at Bohol Island engaged in battle with one of these trading vessels belonging to the southern or Mohammedan Moro.

> Everywhere in the vicinity of Manila "Maynila," on Lubang, in Pampanga, at Cainta and Laguna de Bay, the Spaniards encountered forts mounting small cannon, or "lantakas."[3]

Not only firearms but the art of casting brass weapons had been acquired by the Filipinos along with the art of making gunpowder. Morga's account of the conquest of Manila, 1570, by Martin de Goiti, and of the small island of Lubang near Mindoro by Salcedo (Sucesos de las Filipinas) relates how the Moro had strong forts with high walls on which were mounted brass cannon. Moats surrounded these forts. It is interesting to note that the Mohammedan Moro defender of Manila was known as a "raja" (Hindu), and that after the battle

[3] Relación de la Conquista de la Isla de Luzon, 1572; in Retana, Archivo del Bibliófilo Filipino, vol. 1.

the body of a Portuguese artillerist who had aided in the defense was found among the dead. The Moro rajas continued the struggle against the Spaniard and gathered a fleet of 40 war praus which assembled in the nipa palm inclosed estuaries of the Pampanga and other rivers flowing into Manila Bay. The armor and offensive weapons of the Spanish, consisting of mailed steel, heavy swords, long lances, and firearms, prevailed over the inferior shields, armor, spears, and arrows of the natives. An interesting event in the battle was the cooperation of the natives of the village of Macabebe in what is now Pampanga Province with the Moro rajas. The Macabebe have ever since proved a recruiting ground for the armies of Spain and later of America. A group of Macabebe accompanied General Funston on his famous expedition which resulted in the capture of Gen. Emilio Aguinaldo. The Macabebe, like the Sikhs of India, contribute more than their quota of soldiers for the army of occupation.

For centuries the Malay pirate has been the scourge of the navigator in the waters of the East Indies. Dyak and Moro alike relied more on individual courage and fighting ability than on mere strength of numbers, equaling in their courage and in the extent of their exploits the feats of the English privateers, Drake and Cavendish. Malay piracy continued, disturbed from time to time by the Spanish, but not to be broken up until the arrival of the first steamships in Philippine waters in 1848 made possible the pursuit of the Malay war praus. It had been possible for the praus manned by oarsmen before this time to drop their masts on the approach of a vessel with superior armament and to turn toward the "eye of the wind," where it was impossible for a sailing vessel to follow. The Spanish governor, Claveria, with a force of Spanish and Filipino volunteers entered the pirate country and landed on the island of Balangingi of the Samal Moro, between Jolo and Basilan islands. The Samal are known throughout Malaysia as "bajau" or "orang laut" (men of the sea). Four fortifications were found in the mangrove-covered island. An interesting fact is the large number of 124 brass cannon captured at the time. The activities of James Brooke in his 140-ton armed yacht destroyed the force of the Malay pirates along the north and west coasts of Borneo in 1841.

As late as 1904 the Seranaya expedition, commanded by Maj. Gen. Leonard Wood, encountered the Moro of the Rio Grande Valley, Mindanao, under the leadership of Datto Ali at Seranaya, a Moro fortress and stronghold, to the number of 6,000. This fort "cota," "cotta," "kota," was the greatest military work ever constructed by natives of the Philippine Islands. The frontal extent was over 1,300 yards. A plan of this fort was made and the tracing from which blue prints could be made is on file at military headquarters of Zamboanga. Dr. Edgar A. Mearns, is authority for the

statement that on the day of its capture, March 11, 1904, he was able to count 56 mounted cannon and 59 embrasures that were empty, or, rather, contained gun carriages from which the guns had been hastily dismounted. Nearly all of the guns were subsequently found buried in the moats surrounding the fort or in the ground. The following guns were still mounted: 9 iron guns, caliber 5 inches; 7 iron guns, caliber 3 inches; 4 iron guns, caliber 2 inches; 1 brass 2-inch gun; 34 brass or bronze lantakas of Moro manufacture and of various calibers. The iron guns were exploded or fired by using the Moros' black powder.

Guy Stratton, referring to the three-barrel laubaccas from Cagayan Sulu, is of the opinion that many of the lantakas or bronze cannon employed by the Moro were cast at Brunei, north Borneo, where the brass and bronze industry is quite well developed, although the fact is well known that the Moros are quite capable of manufacturing such weapons themselves.

Several guns taken from a Filipino insurgent arsenal at Talavera, Luzon, where they were captured by General Lawton's division in 1899 were presented to the Smithsonian Institution by order of General Otis. Most of these guns were exhibited at the Pan-American Exposition at Buffalo, N. Y. The guns consist of sections of iron tubing, encased in wood and wound with rattan or in some cases with wire wrapping.

A brass trunion cannon, mounted on a small wooden carriage with two small, solid, wooden wheels with wooden axle was captured in the Camarines, Luzon, by the troops under General Kobbe in 1900. Two heavy bronze cannon mounted on heavy wooden carriages have the same origin.

Improvised bamboo cannon constituted a part of the "Insurrecto" armament of the village of Balanga, Bataan Province, Luzon, and were made on the spot. Such cannon are wrapped with wire, but invariably exploded after one or two firings, creating greater havoc among the troops operating the gun than among those fired upon.

Frequently native troops were found to be in possession of cannon and small firearms of Spanish manufacture. They were adept enough in operating such weapons until their supply of ammunition was exhausted or until repeated firing so heated the gun that it cracked or broke down under the strain. The crude efforts that were usually made in repairing such firearms were such that after a firing or two the weapon exploded or had to be abandoned for other reasons.

Cannon employed by the Moro were uniformly small and could easily be carried by two men. One of these, Cat. No. 275, 751, U.S.N.M., collected by Maj. H. G Lyon, United States Army, has a barrel length of 1 meter and 6.6 centimeters (41 inches) and a bore of 3.25 centimeters (1.25 inches). This cannon is formed of

cast brass and is mounted on a short swivel. A palmwood strip is lashed to the under side of the gun barrel by means of rattan splints. The weapon "Lantaka" comes from the island of Jolo.

Indonesian and Malayan culture survivals—One effect of Spanish occupation of the Philippines was an increase in the density of the native population. Contributory causes were the development of the agricultural and industrial resources chiefly through the encomienda system and the influence of the friars. The real influence of the Spanish, however, lay in the suppression of Moro piracy, in the abolishing of human sacrifice, in the limitation of slavery, the suppression of local tribal wars and feuds, and the institution of head-hunting.

Those regions of the islands where the inhabitants were not influenced by the teachings of Mohammedanism or Christianity remained to a great extent free from the domination of the Spaniard. Such nationalities fall into two large divisions, one located in the mountains of the central upland interior of Luzon and the other division located in the interior of the island of Mindanao. These tribal groups are of the greatest interest to the ethnologist in that they represent the "contemporary ancestors" of the Mohammedanized or Christianized Filipino. Of these two groups, the Mindanao tribes show more Hindu influences in speech and customs, while the Luzon "wild" tribes, especially the Bontok-Igorot, reveal more Spanish culture traits. Still, because of the rugged mountainous terrain of northern central Luzon, the "wild tribes" of Luzon represent a more accurate cross section of the ancient civilization of the Filipino. The iron industry of northern pagan tribes of Luzon as well as of Palawan Island Tagbanua and the Mangyan of Mindoro is much less developed than is that of the pagan tribes of Mindanao, such as the Bagobo, who have borrowed the technic of working brass and iron from the expert Moro.

Occupational, traditional, and political causes have united in making of the Filipino an aggressive fighter. With all the passive disregard of personal danger that accompanies the fatalism of the oriental, the primitive Malay did not extend such fatalism to include a doctrine of nonaggressive pacifism. He held human life of little value under circumstances over which he could exercise no control, but was a courageous and resourceful bearer of the warlike tribal traditions. The Moro has become known historically as the superior warrior in the Philippines, but only so because he was more successful. His political organization included large enough units, the so-called kingdoms and sultanates, to successfully repel the Spaniards with their superior firearms. His feuds and petty local grievances were suppressed in the fanaticism of the Mohammedan reli-

gion which directed attention and hostility toward the outsider. Everywhere in the Philippines and in Malaysia the pacifist did not enjoy the respect of the tribe. An hereditary chief or datto enjoyed double esteem of his subjects if he could lead them successfully in battle.

BOW AND ARROW

Characteristic features of the Negrito bow and arrow.—The bow is the principal weapon of the Negrito in the Philippine Islands and elsewhere in Malaysia, in the Andaman Islands, and in Africa. The bow, as it is usually made by the Negrito, consists of a simple, plain, unwrapped, bow stave, rounded in section and often possessing a longitudinally grooved inner surface. It is provided with a bow string of twisted root or bark fiber. The more crudely constructed bows of some of the Malayan Filipino tribes are merely flattened staves of palmwood or of bamboo flattened toward the ends.

The bow is not a primitive clubbing or throwing weapon, but is rather a primitive gun. It lends increased prehensility to the hand and when flexed brings into application a natural force to aid muscular strength. The bow as a missile weapon lends itself well to the roving and rather furtive life habits of the forest-dwelling Negrito. The Negrito arrow varies with the purpose for which it is to be employed, as for hunting deer and wild pig, for small game, for fishing, and in war. It is either provided with palmwood, bamboo, or iron tipped points, and is either of simple, compound, or composite harpoon construction.

Antiquity of the bow in Malaysia.—The bow was formerly in general use among the more highly cultured Malayan Filipino peoples as well as among the more primitive Indonesians. Old accounts by various Spanish writers relate how practically all of the Filipino tribes employed the bow. Archers were enlisted or, rather, drafted into service on many of the Spanish expeditions undertaken for purposes of war, conquest, and exploration. Padre Caspar de San Augustin relates that Governor de Sande took with him 1,500 Filipino bowmen from the Provinces of Pangasinan, Cagayan, and the Visayan Islands on his expedition against Borneo. A few years later, in 1593, Governor Das Mariñas had with him Filipino bowmen on his expedition against the Moluccas. Artieda describes large bows employed by the Filipino, more powerful than those of English archers. The long bow of the English archer has gone down in history as an efficient weapon, although few, if any, examples have been preserved in museums or elsewhere; the production of bows of similar or superior effectiveness implies a long acquaintance with the weapons of the bow type. Some of the Filipino tribes mentioned by early writers as using the bow are the

Tagalog of the central Luzon plains, all of the pagan tribes of the mountainous region of northern Luzon, as also the civilized Ilocano; the pagan tribes of Mindanao, the Mangyan of Mindoro, the Batak of Palawan, the civilized Bikol of southern Luzon; the Visayan, and Moro—in fact, all tribes, peoples, and nationalities with which contact was established and whose culture consequently became known to the civilized world. The Moro, like many of the other Filipino peoples, continue to use the bow and arrow even at the present time. Formerly, arrows and lances were presented as ceremonial offerings to their deity and were hurled into the waters surrounding Jolo and Zamboanga when the Moro were embarking on an expedition. Some Filipino peoples that have adopted other weapons or that have allowed the use of the bow and arrow to lapse into a subordinate position still use the bow as a toy or in shooting birds or other small game. Dr. A. E. Jenks refers to such secondary use of the bow among the Bontok Igorot.

> Small boys in Bontok pueblo make for themselves tiny bows 1½ feet or 2 feet long with which they snap light arrows a few feet. But the instrument is of the crudest, merely a toy, and is a thing of the day, being acquired from the culture of the Ilocano who live in the pueblo. The Igorot claim they never employed the bow and arrow, and to-day, at least consider the question as to their ever using it as very foolish, since, they say, pointing to the child's toy, it is nothing. * * * The Ibalao of the southeastern Nueva Vizcaya, Nueva Ecija, and adjacent Isabelle employ the bow constantly.

In an account by Dr. John Frances Careri dating back to 1693–1697, the Zambales nationality is reported as using the bow and arrow, a short spear, and a short hand weapon or knife which was worn at the girdle. The use of poisoned arrows was noted. These arrows were pointed with iron or sharp stones. A peculiarity of the iron arrow heads was in the boring of the head so that it would break off when entering the victim's body. A wooden shield that was twice as long as broad was attached to the arm by horizontal wooden supports at the back of the shield. This shield was employed both for parrying and as a target.

Some of the older types of war arrows of the Moro are quite similar to ancient Zambales arrows in that the head, consisting either of stone, metal, bone, or ivory, comes off in the wound made by the arrow. The arrowhead is sunken into or socketed over the foreshaft so that the shaft may become detached while the arrow head remains in the wound.

The Malaysian self bow; parts, function, materials.—The type of bow used in the Philippine Islands is the self-bow; it is not reinforced. The flat bows of the southern islands are often wrapped with ornamental transverse windings of rattan splints and the overlay is then waxed with a black gummy cement. As the bow stave

is of palmwood in both the wrapped bow and in the unwrapped, and as the stave is usually formed in the same manner—convexly rounded in section toward the outer or front side and flat or concave on the inner side—it appears that the wrapping is purely ornamental and is not a survival of an older type of Asiatic composite bow with its layers of reinforcement. The bow is always held vertically by the Negritos and by the Malayan bowmen. The bow stave is usually longer than the height of the archer. This applies also to the Moro and to those nationalities that have adopted the use of the horse. In their case the introduction of horses did not lead to the shortening of the bow, whereby it could be used to advantage in hunting from horseback as was the case with the North American Indian. This does not imply that the Filipino bow did not gradually assume specialized functions, but specialization in Filipino weapon production reached its greatest extent in the manufacture of metallic hand weapons for cutting and slashing. In this one may see environmental factors, the forest and the tropical climate, operative. The bow, however, remained relatively quite crude and obsolescent except among the primitive Negrito tribes, whose livelihood depends upon the skillful use of this weapon upon which their best efforts and greatest skill are lavished.

Parts to be considered in the Philippine bow are the bow stave, bow cord, method of fastening, reinforcement or wrapping of stave, its shape and surface finish, and the position of the cord. The materials employed, the functions, method of arrow release, antiquity, distribution, and variation in type are factors that are of interest and valuable in a description and classification of types.

Arrows of the various Filipino peoples differ in the following respects: In the shape and size of the various component parts, in the materials, in the parts making up the shaftment, in the feathering, in the employment or nonemployment of arrow poisons, and, finally, in the functions and use to which the missile is put. Peoples showing greatest ingenuity in arrow production are the Negrito and the Moro; the former chiefly in the variety of types and in the presence of iron points, while the Negrito excels chiefly in the effectiveness of the few types that he produces and in the use of poisons. The Moro polish their arrow and bow shafts excessively and devote much time to this work. The wood for the bow stave is chosen for its uniformity, and is selected for its straight grain and its toughness. Wood from the heart is selected and is shaped according to the kind of service to which the weapon is to be put. For war, the bows and arrows are larger than for hunting and for target practice. The use of coconut oil for polishing is general among the Moro. The shaft is rubbed with skin and

oil for hours until a brilliant polish results. The operator sits the while on the bare ground. Feathering practiced by the Moro differs from that of the Negrito. The Negrito uses the entire feather of a bird and places it flat against and parallel to the shaft, while the Moro splits the shaft near the nock end with the sharp point of a knife and the feather is then dropped in the slot so that the grain or the feathering projects at right angles to the plane of the shaft. The feather and the encompassing shaft is bound at the nock end with waxed and corded bejuco fiber.

Feathering serves in most cases to accurately guide the flight of the arrow. The feathering of the Negrito arrow, although carefully wrapped at both stem and feather tip with rattan or other strong fiber is not so effective. The entire feather, usually of a hawk or some other large bird, lies against the surface of the shaft, and while often so curved from stem to tip as to be more of a detriment than an aid in insuring accuracy of aim, lies nevertheless parallel to the shaft, often touching tips with other feathers that have been similarly placed; the number of feathers thus placed numbering either two, three, four, or sufficient in number to completely encircle the shaft. Feathering on Negrito arrows is placed not at the nock end or near that end where it would do the most good, but is often attached far down the shaft. It is said that such an arrangement insures magical flight like that of a bird.

The arrow release as practiced by all of the Filipino peoples including the Negrito is the Mediterranean; the cord is drawn taut with the tips of the three middle fingers, the nock of the arrow coming below the cord. The bow is held in a vertical and never in a horizontal position. One end of the bow is placed on the ground, the bow is then grasped with the left hand just below the center. There is considerable variation between the various tribes in the exact manner in which the arrow is held and in the manipulation of the fingers of the right hand in accomplishing the arrow release, but essentially the same method is followed. (Pls. 16, 17, 19.)

Philippine arrow poisons.—The well-known practice of poisoning the tips of the tiny missile darts shot from the sumpitan or blowgun is repeated by several Filipino tribes and peoples. In Java and other Malaysian islands the juice of the upas tree is employed for this purpose. The sap of the upas tree is procured by boring a hole in the trunk. Small containers made from a joint of a bamboo stem are filled with the creamy liquid; they are then tightly closed so as to exclude the air. When exposed to the air it rapidly turns black. The arrow or dart point is simply smeared with the juice; if it be fresh the wound is sure to be fatal; if exposed to air the virulency of the poison seems to be greatly diminished.

Mr. Raymond F. Bacon [4] reports some results of experiments conducted on Philippine arrow poisons. He finds that the sap of *Antiaris toxicaria* Leschenault is identical with the sap of the upas tree. This poisonous sap is used on blowgun arrows by the Tagbanua of San Antonio Bay, near the southern end of the island of Palawan. On the island of Mindoro the native use of this material for the poisoning of arrows has been noted near Bulalacao. The Negritos of Bataan Province on the island of Luzon are reported as employing the bark and sap of two trees, the *Diospyros canomoi* and the bicag, in the production of arrow poison. Various other poisons are produced from fermented pineapple leaves and animal poisons, none of them, however rivaling in strength the antiaris poision extracted from the upas, the use of which on the blowgun darts is quite sufficient to bring down and to kill some of the larger animals.

The crossbow.—Built-up bows are made by the Moro who use them as a crossbow. The bow stock is composed of two or three pieces of springy, close-fibered wooden strips, wrapped or bound together with wood splints, corded fibers, or hide strips. Such a bow stave is generally connected with a gunstock, which is composed of finely finished hardwood and is provided with the proper triggers made of wood or wire or bone for gripping and releasing the bow cord.

The crossbow may be traced back to the Roman scorpio, which was used to discharge stones and arrows. Although this weapon is usually thought of as belonging to that historical period immediately preceding the introduction of firearms into European warfare, it is still found in use in certain areas of Africa, Asia, and Malaysia. The crossbow occurs in Africa only among the Fans of the Gaboons in the western part of the continent. It resembles the crossbow found in China in so far as concerns the method of arrow release. In Asia the crossbow occurs both in China and in Japan; also in the hill country of Burma, in north Siam, and in Assam. The Aino of northern Japan make a crossbow set as a spring trap in hunting bears. In the Nicobar Islands the crossbow is used as a gun for shooting birds. It is their only type of bow. A toy crossbow was brought from the island of Simalur off the south coast of Sumatra by Dr. W. L. Abbott, which has an ingenious arrangement of the bolt which is placed in a groove within a hollow joint of bamboo. The crossbow of the Philippine Islands seems to have been widely distributed in the past and to have been much modified in its form and usage through contact with the Chinese and the Spanish. These modifications consist chiefly in the use of the Chinese repeating cross bow with its movable block magazine; also in the shaping

[4] Philippine Journal of Science, vol. 3, no. 1, February, 1905.

of the crossbow stock and the trigger release made after the fashion of the Spanish rifle.

Type specimens of bows, arrows, and quivers.—Bows and arrows from the Philippine Islands now in the National Museum are derived from the following tribes: The Mangyan, of Mindoro Island; the Tinggian, of northern Luzon; the Negritos, of Zambales Province, Luzon, and from the islands of Panay, Negros, and Palawan; the Moro, of northern and southern Mindanao Island and Sulu Archipelago; the Bagobo, of southeastern Mindanao; the Tagbanua, of Palawan; the Tagalog and Pampangan, from the provinces of central Luzon; the Batak, of Palawan; the Kalinga, of northern Luzon; the Igorot tribes of north central Luzon; Bikol, from southern Luzon; and the nationalities of the Visayan Islands and other southern island groups.

CATALOGUE OF TYPE SPECIMENS

Crossbow.—Bow and stock are of bamboo; the bow cord of abaca (manila hemp) fiber is fitted to the tapered nock ends of bow by means of a looped knot. The tubular bamboo stock is slotted and fitted with a bamboo spring and trigger, the bow is similar to the bamboo crossbow collected by Dr. W. L. Abbott at Simalur Island, off the west coast of Sumatra, and which is now in the museum.

Length of bow, 48.3 centimeters (19 inches). Collected by Gen. Jacob Kline, United States Army. Cat. No. 313950, U.S.N.M.

Crossbow.—The bow is turned 90 degrees on the pivoted head of a folding device on distal end of stock. This arrangement permits carrying through the narrow jungle trials. Stock is fashioned in imitation of rifle stock with hardwood trigger bow cord release. Stock has sectional grooved bore open along the top through which missile is projected. Bow cord of twisted rattan attached to incised groove at each bow horn. Stock is fashioned from lauan wood; bow of palmwood, *Corypha minor* (*palma brava*).

Length of bow, 64.9 centimeters (25.5 inches); length of stock, 50.9 centimeters (20 inches). Collected by Gen. Jacob Kline, United States Army. Cat. 313947, U.S.N.M.

Bow, Negritos, Zambales Province.—The material from which this bow is made is the palmwood, *Corypha minor* (*palma brava*); it is beautifully made and highly polished. The bow tapers toward the horns, which are truncated 2 centimers (0.8 inch) from the tip and circular in section. The inside of bow stave has a grooved belly extending from nock to nock; the outside is convexly rounded. The resemblance of the bow to the reddish black palmwood grooved bows of the Caribs of British Guiana is striking. The bow cord is of twisted bark as strong as sinew. The cord does not touch the

bow at center as there is a curvature of the bow outward. Length of bow exceeds by several centimeters the height of a full grown Negrito and measures 196 centimeters (75.5 inches) in length; 3.3 centimeters (1.3 inches) in width at center; and 1.8 centimeters (0.7 inch) in section, with a groove hollowed on the inside of bow to a depth of 0.3 centimeter.

Collected by Lieut. W. F. H. Godson, United States Army, near Camp Stotsenburg, Pampanga, Luzon. (Pl. 2, No. 1.) Cat. No. 306681, U.S.N.M.

Bow, Bagobo, Davao Province, Mindanao.—The palmwood bow stock is wrapped with a continuous spiral of rattan splint. Over this simple roll wrapping are placed braided bands of rattan at evenly spaced intervals along the bow. These braided bands have an average width of 1.5 centimeters except the one at the center of the bow, which is 18 centimeters (3.2 inches) wide. The weave is a complex cross weave similar to the rattan braided bands placed on the handles of Moro parangs. The bow stock is not nearly so highly polished as are the Zambales Negrito bows. The bow is straight, so that a simple bow cord would touch at the center. It is flat on inside and convexly curved on outside and at lateral edges. Cord is taut only when the bow is flexed. This operation is performed with the aid of the extended foot and toe muscles of the Bagobo warrior. The cord is composed of the split section of a bamboo, 0.7 centimeter wide extending to within a few centimeters of the nock at one end or horn of the bow. The bow cord of bamboo splint terminates in a bulbous enlargement at each end. Wrapped around the splint cord at a point just below each bulbous truncated end is a two-ply twine of the same material. This wrapping extends in a loop which slips freely about the nock end of the bow, and is fitted, as mentioned before, into the nock groove only when the bow is bent. The object in thus constructing the bow cord is to remove the tensile strain from the bamboo splint cord except when the bow is actually in use. There are numerous encircling grooves incised around the bow ends above the nock. These grooves are for fastening the short extension of the two-ply abaca cord which prevents the bamboo bow cord from slipping down the bow too far when not in use and thus increasing the danger of breakage of the rather weak bamboo splint cord.

Length of bow, 185 centimeters (71 inches). Collected by Misses E. H. and S. S. Metcalf. (Pl. 2, No. 3.) Cat. No. 286267, U.S.N.M.

Bow, Moro, Mindanao.—This bow is not up to the standard of the Bagobo bow so far as beauty of design and workmanship displayed in the wrapping is concerned. The bow stock is of the familiar palmwood, *palma brava* and is highly polished. It stands perfectly straight, is flat on its inner surface and broadly convex on the out-

side. The tapered lateral edges are elliptic at the center but are nearly rounded near the nock where the bow stock becomes transversely elliptic with a greatest diameter at right angles to the greatest diameter at the center. The simple roll wrapping does not extend the entire length of the bow stock. It is covered with a coat of black beeswax and several small braided bands of rattan placed at intervals. The ends of the several splints of rattan wrapping are tucked under the remainder of the wrapping when these ends are not secured by braided bands of rattan. The bow cord is similar to that of the Bagobo bows with the added feature of a reinforcement wrapping with a thin fibrous band extending the entire length of the splint cord.

Length of bow, 166 centimeters (71 inches); sectional width at center, 1.7 centimeters (0.8 inch). Collected by Dr. E. R. Hodge. (Pl. 2, No. 4.)

Bow, Negritos, Island of Negros.—The bow stock has been carved from the heavy *palma brava* (*Corypha minor*), and has been rudely shaped into the form of a flat slab, tapering toward the horns, slightly concave on the inner side and slightly convex on the outer side. Nocks are merely slopes of the truncated horns of the bow.

Length of bow, 184.5 centimeters (71 inches); width at center, 4.6 centimeters (1.9 inches), sectional width, 1.3 centimeters (0.5 inch). Collected by Mrs. James F. Courts. (Pl. 2, No. 2.) Cat. No. 292433, U.S.N.M.

Palmwood bow, Negritos, Zambales Mountains, Luzon Island.—The bow stave is shaped from a section of *palma brava* (*Corypha minor*) wood, is flattened on the outer surface, concave on the inner, and tapers from center toward the horn ends. Back of stave is grooved throughout its length from the nock ends. The surface is polished uniformly and obviously not entirely through use. The bow cord consists of a strand of twisted bastlike fibrous bark which is apparently as tough as sinew. It is 0.3 centimeter in sectional diameter and is fastened at the nock end of the truncated horns of the bow stave by means of a double loop which is prevented from slipping by the tautness in which the cord is held by the slightly flexed stave. Cord rests about 8 centimenters (3.1 inches) from bow stave at the center. In this arrangement the slack bow cord of the southern island peoples contrasts quite markedly. Necessity for the variation may be looked for in the materials there employed in constructing the bow cords, which are uniformly split sections of the outer indurated surface of the bamboo which would break under continuous tension.

Length of bow, 188 centimeters (72 inches); sectional thickness, 1.5 centimeters. Cat. No. 329528, U.S.N.M. Collected by John Howard Ford.

Arrows and quiver, Kalinga, Mountain Province, Luzon.—The type of quiver more commonly made by those tribes using the bow and arrow is formed from two or more joints or nodes of bamboo. In this specimen the septum of the lower joint is allowed to remain. This serves as a bottom for the quiver. One-half the distance up the length of the quiver the siliceous walls are left intact, but from that point to the top of the quiver the walls are cut away on one side, leaving one-half the sectional circumference. This facilitates removal of the arrows when they are to be used. A cord of twisted bark is looped through a hole in the uncut sector of the bamboo near the top for suspension.

The arrows are similar to the typical Negrito arrow; the head and foreshaft combined is formed of palmwood and is unbarbed; the shaft is formed of the dwarf variety of bamboo; feathering is similar to that described as the typical Negrito method, namely, the two or three feathers used are left intact, except for the base end of quill, which is bisected, one section removed and the other laid flat against the shaftment; tips of feathers and bisected base are each wrapped with waxed wrappings of bark fiber so that the feathers rest with split quill lying flat against the shaft and spines projecting away from the shaft.

Length of quiver, 88.4 centimeters (2 feet 10 inches); length of arrows, 109.2 centimeters (3 feet 6 inches). Collected by Capt. H. C. Warmsley (pl. 1). Cat. No. 211653, U.S.N.M.

Quiver and arrows, Moro, Mindanao.—The quiver is of bamboo with a cap woven of rattan splints in single-twilled basketry pattern. The quiver is provided with a small carrying handle attached by means of abaca cord lashings braided about both handle ends, which lie flat on the surface of the bamboo quiver case and are passed around the surface of quiver in simple roll wrappings. Cord lashings as well as the basketry quiver cap are pitched with a black gummy cement. A spur, 41 centimeters (16.1 inches) long, composed of one-third the sectional circumference of the extended bamboo quiver casing, projects from basal end of quiver and tapers to a bluntly truncated point. Aside from being ornamental, this spur serves as a ground support for the quiver when removed from the belt. The basketry cap of the quiver likewise terminates in a spur which is much shorter, namely, 3 centimeters (1.2 inches), and is the core or starting point from which the basketry work is begun. It serves also as an ornamental button or cap. The quiver is of but one section or joint of bamboo, the septum serving as the basal end; the projecting spur is an extension of the adjoining section.

The arrows are of uniform length and have bamboo shafts, tipped with tapered heads of *palma brava;* three of the palmwood heads have iron points inserted into a bifurcated notch at the distal end.

The shaft is plain, is not notched at the nock, and has but one small wrapping at the point of insertion of the palmwood foreshaft or arrowhead. The quiver contains several extra palmwood heads, some pointed, others unpointed. (Pl. 2, No. 6.)

Length of quiver section, 60.7 centimeters (23.9 inches); cap, 44.2 centimeters (17.4 inches); length of spur, 40.5 centimeters (15.9 inches); length of arrows, 78 centimeters (30 inches). Collected by Dr. E. R. Hodge, United States Army.

Arrows, Moro, Sulu Archipelago.—This type of arrow represents a form which is found in Papua and among the Melanesians. Nowhere else in the Philippine Archipelago is this type of arrowhead produced. The shaft, however, is in each instance duplicated in the types occurring among the Mindanao Moros and among the Negritos of Luzon; the peculiarity lies in the hardwood foreshaft and arrowhead, also of wood. Shaft is formed of a variety of bamboo; on some of the shafts the nock end is notched, and abruptly truncated on others; feathering, wherever it occurs, is similar to that found among the Negrito tribes; a basketry ferrule of braided strips of rattan encircles the distal end of shaft and strengthens it at the point of insertion of the palmwood foreshaft for a distance of 6 to 10 centimeters. In some instances the foreshaft is plain and has attached to it by rattan thongs an arrowhead of split bamboo, in which case the rattan wrapping continues in openwork winding for some distance down the bamboo shaft as well. The black palmwood foreshaft is usually carved in fantastic scrolls and is inlaid with lime, Melanesian fashion, or painted a deep red, the arrow point or head is really a continuation of the foreshaft with the carved scrolls changed to barbs, placed either bilaterally or in series on one side of the head only. The bilateral barbs are formed by cutting away triangular sections from the hardwood head near the center with the base of the triangle nearest the center, and the apex at the lateral edge; this form of barbing is peculiarly efficient in tearing and rending the flesh; the object is to make a large hole so that the victim will bleed to death. On some of the arrows the bilateral barb gives way near the tip to the simple recurved barb.

Length of palmwood foreshaft and head 130 to 143 centimeters (50 to 55 inches). Collected by Frank F. Hilder for the Government board, Pan American Exposition. (Pl. 1, upper.) Cat. No. 216832, U.S.N.M.

Arrows, Bagobo, Davao Province, Mindanao Island.—These Bagobo arrows of bamboo are unique among Philippine types as they might easily be mistaken for spears. They are rather crudely made, yet are probably effective missiles. The shaft is formed of several lengths of bamboo and is much longer than the average Malay

arrow. The small end of the bamboo shaft is at the proximal end, which is abruptly truncated; the heavier distal end has inserted in it an arrowhead, also made of bamboo. The hastate-shape head becomes thicker and narrower toward the point of insertion. The hardened siliceous outer surface of the bamboo shaft has been removed in two sections for a distance of 2.5 centimeters (1 inch), leaving two projecting flanges, between which the neck and tang of the arrowhead is inserted. A simple roll of wrapping of native cord composed of two-ply abaca fiber encircles the shaft end as a ferrule and envelops the tang of the arrowhead and the projecting bifurcate sections of the shaft. There is no feathering or wrapping at the nock end of shaft.

Length of hastate arrowhead, 37.5 centimeters (14.8 inches); length of shaft, 125 centimeters (48 inches). Collected by the Misses E. H. and S. S. Metcalf. (Pl. 3, No. 4.) Cat. No. 286267, U.S.N.M.

Arrows, Negritos, Zambales Province, Luzon.—These arrows have slender bamboo shafts, wrapped with bejuco and abaca fiber at distal and proximal ends; feathering consists of three feathers on one arrow and of two oppositely placed feathers on the other. Arrowheads are of iron, one spatulate and the other lanceolate leaf-shaped. Tang is socketed in shaft. The broad arrowheads are designed to make a large wound and thus to cause much loss of blood.

Length of shaft, 91.5 centimeters (35.2 inches). Collected by E. H. Hammond. (Pl. 4, No. 1, No. 5.) Cat. Nos. 288411–288412, U.S.N.M.

Arrow, Negritos, Zambales Province, Luzon.—This arrow has a lanceolate leaf-shape iron arrowhead and is larger and longer than most of the Negrito arrows, but is constructed in the same fashion as the smaller previously described iron arrowheads. The feathering has disappeared, but originally triple feathering was attached by a wrapping of bejuco and abaca fiber at base of feather and again at the tip with a similar wrapping. The great length of feathers employed necessitated placing base of feathering at a considerable distance from the proximal end of shaft. It is this detail in the feathering that decides the position of the feathering on shaftment. This statement does not imply that feathering has no additional significance to the Negrito other than insuring accuracy of flight, as previously pointed out.

Length of arrow, 115 centimeters (44.2 inches). Collected by Lieut. W. F. H. Godson, United States Army, near Camp Stotsenburg, Pampanga. (Pl. 4, No. 7.) Cat. No. 306681, U.S.N.M.

Arrow.—Shaft consists of several sections of slender bamboo cut off squarely at the nock. There is no feathering or wrapping except at the distal end. The iron head has a well-marked median ridge and rounded lateral edges near the base where it becomes con-

stricted into the tang which is inserted over the bamboo shaft. There are no barbs; the head is one of the finest, although the shaft is quite crudely made.

Length of head, 12.7 centimeters (5 inches); length of shaft, 77 centimeters (30.3 inches). Collected by Mrs. James F. Courts. (Pl. 4.) Cat. No. 292420, U.S.N.M.

Arrows.—These Moro arrows differ from one another in several respects. No. 275743, U.S.N.M., has a wood shaft, while No. 275745, U.S.N.M., has a shaft of slender bamboo. The latter is feathered while the former is not. No. 275745, U.S.N.M., has a foreshaft of wood, a lanceolate iron head, and a panel of rickrack ornamentation on shaft. The ferrule of wrapped cord at distal end of foreshaft and at base of bamboo shaft is covered with a black gummy substance like beeswax. No. 275743 has ferrule of nickel silver of nonnative manufacture.

Average length of arrows, 107 centimeters (41 inches). Collected by Maj. H. G. Lyon, United States Army. (Pl. 4, No. 4, No. 9.) Cat. Nos. 275743–5, U.S.N.M.

Arrows, Moro, Mindanao.—The variation in type to be noted in these arrows is characteristic of the diversity shown by the Moro in the production of other metallic weapons. One arrow has a shaft of black hardwood, tapered from the distal toward proximal end; no feathering or wrapping cord; truncated nock end; ferrule of copper socketed over tang end of iron arrowhead and punched at base so as to adhere to wood shaft; lanceolate head, tapered at the neck where it expands to a socket adjoining the copper ferrule. Two of the arrows have a light slender cane shaft, wrapped at both ends with rattan; hardwood foreshafts ornamented with banded fillets incised at intervals; narrow, acute pointed iron heads have tang inserted in foreshaft. Shaft is not feathered and is abruptly truncated at nock.

Average length of arrows, 77 centimeters (30.3 inches). Collected by Dr. E. R. Hodge, United States Army. (Pl. 4, Nos. 6, 8, 2.)

Arrow with iron point, Bikol, southern Luzon.—The shaft is composed of several joints of bamboo; foreshaft is of hardwood; head consists of iron. The highly polished bamboo shaft has surface decorations of transversely incised lines near the nodal elevations and a rickrack pattern near the nock section of shaft. Nock is grooved in characteristic Negrito style but is not feathered. The shaft is wrapped with rattan filleted for a distance of 1 centimeter at each end. The hardwood foreshaft is bulbous at the base where it is inserted into the bamboo shaft but tapers toward the distal end, which is inset with a small leaf-shape iron point. The specimen is an old type no longer produced.

Length of arrow, 103 centimeters (40 inches). Collected by Maj. H. G. Lyon, United States Army. (Pl. 4, No. 3.) Cat. No. 275747, U.S.N.M.

Arrow, Bikol, southern Luzon.—The shaft is of bamboo and is wrapped at each end with pitched abaca fiber. The foreshaft is made of palm wood, bulbous at base and tapering toward distal end, where it is socketed into the neck of a triangularly pointed bamboo head. The arrowhead is discolored with a poisonous preparation covering it.

Length of arrow shaftment, 104 centimeters (40 inches). Collected by Gen. James W. Bell, United States Army. (Pl. 3, No. 3.) Cat. No. 209356, U.S.N.M.

Cane and palm wood arrows, Moros, Boac, Mindanao.—Shafts consist one of cane and the other of bamboo; they are truncated at proximal end, unfeathered, and are not wrapped except at distal end, where a short wrapping of rattan secures the hardwood foreshaft which is at the same time an extension of the arrowhead. The head is fashioned of cocoa palm wood and is abruptly truncated.

Length of arrow, 87 centimeters (33.5 inches). Collected by Maj. E. L. Hawkes (Pl. 3, No. 3.) Cat. No. 210313, U.S.N.M.

Bamboo and wood compound arrows, Bagobo of Mindanao and Negritos of Luzon.—Compound shafts are formed of bamboo. The Negrito arrow, Cat. No. 306681, U.S.N.M., is feathered while the Bagobo arrow, Cat. No. 286266, U.S.N.M., is not feathered. The former type has the characteristic notched or grooved nock of the Negrito missile, while the latter is abruptly truncated at the nock. Feathering of Negrito arrows is always crude and not especially adapted to the diminishing of wind resistance. The quill is slit open from the base; one segment is removed part of the distance while the remaining segment is waxed with a beeswax preparation. It is placed flat against the arrow shaft and is wrapped with fibrous bark and over that with a layer of bejuco splints; the body of the feather is confined only at base and at tip where there is another wrapping of fiber. These Negrito and Bagobo arrows each have a compound head of bamboo or wood, but the mode of attachment differs in each.

The Bagobo arrowhead is made of two triangularly sharpened sections of bamboo. These sections have two series of bilateral barbs and a long triangular point. A long tapered neck constriction serves as a tang; it is inserted into the proximal end of the shaft and is wrapped with a winding of rattan. A small piece of cane has been placed between the two prongs so that they stand about 1 centimeter apart at their tip. The Negrito compound arrowhead is composed of three pronged points, each triangular in section, plain on the outside but barbed with several series of lateral barbs at each of the in-

ner edges of the arrowhead points. The points are not inserted into the shaft, but are cut on a bias so as to fit snugly against the sides of the shaft, where they are securely wrapped with cord of twisted bark.

Length of head, 10 centimeters (3.9 inches); length of arrows, 154 centimeters (60 inches). Bagobo, Mindanao Island, and Negritos, Panay Island. Collected by Misses E. H. and S. S. Metcalf and Lieut. W. F. H. Godson, United States Army (pl. 3, Nos. 7, 8.) Cat. Nos 286266 and 306681, U.S.N.M.

Arrow, Negritos, Zambales Province.—The shaft is formed of a shoot of bamboo; the head is of iron shaped like a spike, squared at the base and barbed at each of the four corners with 20 to 30 barbs formed by chiseling; the point is gradually tapered and plain. The tang is socketed into the bamboo shaft and is wrapped with bejuco for a distance of 7 centimeters. The forward end of the wrapping is blackened with beeswax. Feathering consists of two feathers resembling the large wing feathers of a hawk; they are attached by means of a wrapping of split bejuco (rattan) at a distance of 19 centimeters (7.5 inches) from the nock. The nock end of the shaft is wrapped with bejuco and has a slotted incision at the nock. Length of arrow, 140.6 centimeters (54 inches); length of iron head, 13.3 centimeters (5.2 inches). Collected by Lieut. W. F. H. Godson, United States Army (pl. 4, No. 10) Cat. No. 306681, U.S.N.M.

Composite arrow, Negrito.—This is a composite arrow type resembling in several details the detachable arrowhead made by the Negrito in Africa, in New Guinea, and elsewhere in Malaysia. The shaft is fashioned from a slender shoot of bamboo to which has been attached near the distal end a cord loop or lanyard composed of four strands of two-ply native cord; the place of attachment is securely bound with sennet fiber; to the other end of the composite lanyard cord is attached a pointed iron arrowhead barbed with triple pairs of barbs. When about to be used the iron arrow point is inserted into the distal end of shaft which is wrapped with bejuco; upon striking, the barbs hold the head embedded in the flesh of the game while at the same time the head is pulled from out the socketed shaft. The lanyard cord which is 55 centimeters (17.7 inches) long, drags the detached shaft behind until the wounded animal is caught by the pursuing hunter. Feathering consists of three feathers placed 25 centimeters (10.2 inches) from the nock; the nock is notched and has a bejuco wrapping cover.

Length of shaft, 98.5 centimeters (38 inches); length of iron head including tang, 14.3 centimeters (5.6 inches). Negritos, Zambales Province, Luzon. Collected by Lieut. W. T. H. Godson, United States Army. (Pl. 4, No. 12.) Cat. No. 306681, U.S.N.M.

Composite harpoon arrow, Negritos, Zambales Province, Luzon.—The shaft consists of a somewhat irregular wood stick which has the coloring of molave. The nock has the characteristic notched incision peculiar to Negrito arrow shafts. Proximal shaft end shows traces of fire burning over which has been placed a wrapping of bejuco. Feathering has been lost, but was originally placed 23.5 centimeters (9.3 inches) from the proximal end. Distal shaft end is wrapped for a distance of 23 centimeters (9 inches). A unique weaving of rattan splints extends a distance of 5 centimeters (2 inches) from the distal end of the shaft. The weave might be termed a reverse twill or herringbone pattern as the splints are passed over one, under one, and then brought back again at right angles so as to form seven series of ridges where the reversed element is caught up by the opposing reversed element. Just above this basketry ferrule is the place of attachment of the harpoon lanyard, which consists of five distinct two-ply strands of native cord looped about the shaft and wrapped with bejuco. The lanyard is 127 centimeters (50 inches) long. The iron arrowhead has three parallel sets of barbs together with a peculiar tailpiece with extends 4 centimeters (1.6 inches) beyond the tang socket. The most unique feature of this weapon is the tang piece, which is composed of a carved section of wood 11 centimeters (4.3 inches) long, with the smaller end fitted into the socket of the iron arrowhead and with the larger end fitted to the socketed and ferruled opening of the shaft. This device is also employed by the Bushmen of Africa who sometimes employ as many as five distinct pieces in their composite arrowheads. It is also used by the Negritos in Africa, in New Guinea, in the Andaman Islands, and elsewhere in Malaysia. It constitutes a culture survival unique in the history of primitive peoples. Negrito tribes are encountered using this type of composite harpoon arrow even when entirely surrounded by peoples equipped with entirely different weapons, including distinct arrow types.

Length of shaft, 97 centimeters (37 inches). Collected by Lieut. W. F. H. Godson, United States Army. (Pl. 4, No. 11.) Cat. No. 306681, U.S.N.M.

Negritos, Zambales Province, Luzon, composite harpoon arrow.—The bamboo shaft, bejuco wrapping, basketry ferrule, and multiple strand lanyard attachment, all are similar to the unique Negrito composite arrows just described. There are, however, these differences: The wood tang piece is attached to the lanyard at a point 8 centimeters from the iron arrowhead so that it may be socketed when the arrow is to be used. In the previously described arrow the unsecured wood tang is usually lost; in this shaftment the piece is retrieved each time that it is used. The arrow has no barbs and the tailpiece is likewise unbarbed.

Length of shaft, 102 centimeters (40 inches). Collected by E. H. Hammond. (Pl. 4, No. 13.) Cat. No. 288405, U.S.N.M.

Compound harpoon arrow, Negritos, Zambales Province, Luzon.—The shaft is ornamented with short panels containing incised lines transversely cut in rickrack and is formed of several uncut joint lengths of thin bamboo; feathering consists of four characteristically large bird wing feathers, crudely fastened at a distance of 16 centimeters (6.3 inches) from the nock, with a wrapping of bejuco. The bejuco wrapping at the distal end of shaft extends for a distance of 13 centimeters (5.1 inches). One end of a two-ply double cord is looped around the shaft 8 centimeters (3.2 inches) from distal end; the other end is looped in a similar manner about the sharpened bamboo arrowhead just below the place of attachment of the two series of bilateral barbs. The arrow is detachable and remains in the wound, being held there by the barbs. Barbs consist of series of five and six short curved thorns resembling very much the extended claws of a small raccoon; these barbs are the thorns of some creeper and are attached to neck of arrow by bejuco wrapping; the bamboo arrowhead is shaped in the form of an elongated triangle with acute point.

Length of shaft, 104 centimeters (40 inches); length of head 15.3 centimeters (6 inches). Collected by E. H. Hammond. (Pl. 3, No. 6.) Cat. No. 288409, U.S.N.M.

Compound harpoon arrow, Negritos, Zambales Province, Luzon.—Shaft consists of several joint lengths of a slender cane filled with pith; it is not as strong as bamboo and is unfeathered. There is no ornamental design on surface of shaft; arrow and harpoon attachments are identical with those on the previously described missile.

Length of shaft, 85 centimeters (32.7 inches); length of bamboo head, 18.5 centimeters (7.3 inches). Collected by E. H. Hammond. (Pl. 3, No. 5.) Cat. No. 288408, U.S.N.M.

CLUBBED WEAPONS FOR BRUISING AND CRUSHING

Sticks and stones may well have been among the earliest weapons. Missile stones have played some part in warfare, either when thrown by the hand and arm alone, or discharged from some form of catapult or sling. They have, however, never been such important weapons as sticks and clubs which have been employed in war by peoples of all countries up to comparatively recent times. The clubs of modern peoples are often finished weapons, shaped and trimmed to a convenient length and thickness. Metal-headed war maces have been extensively used by the civilized peoples of Europe, Asia, and Africa.

Distribution, classification, and function of curved war clubs.—Wooden clubs are classified according to their shapes, or according to the nature of the striking end and the method of its employment. They may be straight with plain or ornamented sides; knobbed or bulbous at the striking end; root ended or curved near the striking end; or they may be expanded into a disklike section at the terminal end. The form into which the club is shaped is probably most often arrived at extemporaneously or independently, so that there is not the same sequence of development from a comparatively simple clubbed weapon to the highly efficient and ornamental types as is the case with metallic cutting weapons or missile weapons. Thus, the war club "waddy" of the Australian aborigines is more like a straight unformed stick than are the clubs of any other people. On the other hand, the flat curved hunting club, the boomerang, is a highly specialized form of missile club.

In the islands of the Pacific the wooden club has ranked highest as a war weapon and has retained its position longest. In Melanesia and Polynesia the variety of types, also the degree of skill exercised in ornamental carvings and wrappings have reached their greatest development.

The wooden war clubs of the Philippines were of two kinds, the one probably more ancient than the other. The older type and at the same time the more widely disseminated is the curved or root-ended club. It is usually somewhat bulbous at the striking end and tapers gradually to a grip handle at the base end. The clubs of this type are highly polished and are formed from a hardwood of the molave type. The greatest diameter in section is at the bulbous striking end, from which point a tapered curve of the club is effected so that the terminal end lies nearly at right angles to the body of the club. The club is nearly always octagonal in section, either throughout its entire length or merely at the bulbous striking end.

One example collected by the Philippine Island Commission for the Louisiana Purchase Exposition (Cat. No. 235239, U.S.N.M.) was obtained from the Subanun, of western Mindanao. This club is circular in section except at the striking end, where it, too, is octagonal in outline. A similar club from Luzon collected by Miss Isobel H. Lenman (Cat. No. 316028, U.S.N.M.) is octagonal in section throughout its entire course. A bud-shape tip at the handle end constitutes the pommel. Another club of the curved, root-ended type was presented by James M. Sheridan, who obtained it in a Moro settlement on Dumanquilas Bay, south coast of Mindanao, in 1902. This club, of beautifully polished molave wood, is oval in section except at the bulbous end, where the original octagonal outline has been all but obliterated. A unique feature of the club is

its handle; the grip is fitted to the fingers and is expanded at the base end into a curved bifid pommel similar to that found on the parangs of the Bagobo terminating in a double ogee curve separated by a median cleft. The average length of the war clubs of this type is 53.5 centimeters (21 inches); the diameter at the striking point is of an average thickness of 4.5 centimeters (1.7 inches).

War clubs: Luzon; Subanun, Zamboanga, Mindanao.—The wooden fighting club of the Subanun, of Pantaleon, Mindanao, closely resembles the wooden throwing club of the Luzon tribes; both clubs are formed from a heavy hardwood of the molave type, tapered from a bulbous curved head to a handle grip at the base end. A knob or button consisting of a slight enlargement at the base or grip end prevents the hand from slipping and acts as a leverage; in the Luzon club, the button or pommel terminates in a bud-shape tip at the end of the grip, while in the Subanun club the tip is truncated. The Luzon club is octagonal in section, while the Subanun club is circular except at the bulbous, distal end curvature, where it, too, is octagonal in outline. This fighting club is an old form of weapon in the Philippines and the practical identity of form in such widely separated regions as Luzon and Mindanao would seem to indicate that the throwing or fighting club had at one time a wide dissemination.

Length of clubs, average 54.6 centimeters (21 inches). Subanun club collected by the Philippine Island Commission, Louisiana Purchase Exposition. (Cat. No. 235239, U.S.N.M.) Luzon club collected by Miss Isobel H. Lenman. (Cat. No. 316028, U.S.N.M.)

The second type of clubbed weapon from the Philippine Islands embraces a miscellaneous collection of wooden sword clubs, clubbed shields, blades fashioned from the teeth of the sawfish, whips formed from the tail of the sting ray, and flagellation rods; a miscellaneous grouping of clubbed weapons that is difficult to classify, but which may be conveniently considered here. In clubs and striking weapons of this sort the distinction lies chiefly in the manner in which the head or striking part is attached or formed. Another interesting consideration lies in the object that has been employed to serve as the striking or cutting edge.

Wooden sword club, Bikol, Camarines Province, Luzon.—The use of hand clubs, throwing clubs, and clubbed shields comes earlier in the history of Malaysian weapons than that of sword clubs. This example of the edged sword club is formed from palmwood and conforms in general outline to the kampilan, or heavy fighting sword of the southern island tribes. It is clearly modeled along the lines of the metallic weapons of similar shape and does not constitute a connecting link between the curved fighting club of the Subanun and the metallic parang (sword). It is a heavy weapon,

broad sectioned, with wide distal end, tapering toward the proximal end; it is provided with a guard, handle grip, and small bulbous pommel.

Length of sword club, 73.8 centimeters (29 inches). Collected by Gen. James W. Bell, United States Volunteers. (Pl. 1.) Cat. No. 209359, U.S.N.M.

Clubbed shields.—Numerous shields in the National Museum from eastern and western Malaysia, from the Philippines, and from the outlying islands off the west coast of Sumatra are fashioned from a single piece of strong light wood and consist of an elliptic body, concavo-convex in transverse section, with projecting clublike ends. The shield is strengthened by a midrib, which is expanded into a boss in which the hand grip is excavated. This shield shows plainly a development from the club, and is evidently still mainly used for parrying, though it has widened out under the influence of the spear and of cut and thrust weapons. The solid projecting ends and the midrib preserve the vestiges of the club from which it has been derived. In the Philippines this shield is produced chiefly in the Tawi tawi group and in the Sulu Archipelago, although a shield resembling it is made by the Negritos. (Pl. 1.)

Sawfish blade.—Many adaptations of the blade of the sawfish *Ziphius gladius* for use as a fighting weapon, such as a sword or battle-ax, occur in the Philippines. In some cases the natural shape of the blade is preserved; in others, the saw teeth have been removed from the bony tissue and have been inserted into the lateral edges of a wood blade. Everywhere along the Philippine coast the value of the sawfish blade as a natural fighting weapon is known, although with the penetration of the iron industry to all parts of the islands the need for such weapons grows less. One of the sawfish blades that has been reshaped and fitted to a wooden handle and container for the teeth was collected by the Philippine Island Commission, Louisiana Purchase Exposition, Cat. No. 235240, U.S.N.M.; another blade with the teeth still in place, and with the natural shape preserved save for the hollowing out of a grip handle at the base of blade, is Cat. No. 324737, U.S.N.M., collected by James C. McGuire. The length of the blade in the latter weapon is 83.2 centimeters (32 inches); width, 18.2 centimeters (7 inches).

Sting ray whips.—The tail of the sting ray (*Pristis pectinatus*) was formerly used as a punitive weapon for whipping slaves, prisoners, and as a flagellation rod by the penitentes during Lent. Many of these whips are crude affairs and show but little adaptation to existing weapon types; others, evidently of later manufacture, are neatly cut and mounted in silver. There are many such whips in the Museum collections. Probably the most important use to which

this weapon is now put is as a goad for horse flesh. The surface of the tail of the sting ray has innumerable small spines not longer than an eighth of an inch but sharp and comparatively durable. The efficiency or brutality exercised in the use of such weapons is not less than the artistry sometimes exercised in the mounting and finishing of the adapted form. Cat. No. 290431, U.S.N.M., collected by Mrs. Caroline Bates, has several banded ferrules of silver etched with geometric patterns. A heavy plain silver knob or spud covers the base end.

Flagellation rods, Pueblo of Lubao, Pampanga, Luzon Island.—This instrument of torture consists of a number of short, soft pithy wooden sticks, from 25 to 30, tied together at one end, which is grooved, with a two-ply abaca fiber cord which together with similar cords from the other sticks make up the material from which a rope handle is braided. The sticks are each of an average length of 20 centimeters (7.9 inches), and are uniformly 0.8 centimeter in section. They are smooth as to surface and are varnished with the blood stains of the human victims or "flagellantes." To insure a stiffening or seizing of the rope handle, which is about 50 centimeters (19.7 inches) in length, the unretted leaves of the abaca plant, containing the fiber which is otherwise usually extracted before using, are coiled together and are in turn covered with a wrapping of black cotton cloth. The function of whipping instruments or weapons is varied. They may be employed in whipping slaves, in punishing wrongdoers and criminals, and in the ceremonial and religious flagellations which were universally practised throughout the Christianized sections of the islands. These torture weapons are in evidence especially during the Pentecostal season preceding Easter.

Cat. No. 259689–90, U.S.N.M. Collected by W. Huse Chapman.

THE SPEAR, ITS USE IN WARFARE AND THE HUNT

Distribution and antiquity of the Malaysian spear, parts and materials employed in construction.—It has been assumed that occupational activities of the different Filipino tribes have to a great extent caused adoption or retention of the bow, the spear, or the blowgun. The bow has been termed the natural weapon of the hunter, while the spear has been adopted by those tribes that gave up hunting and life in the forest and became agriculturalists instead. Another assumption accepted by some writers is that the bow and blow-gun are racial characteristics, in that the bow is found wherever the Negrito is at home, and that the blowgun "sumpitan" is the natural Malay weapon. There is probably some truth and error in each of these assertions. The bow is a primitive weapon and was retained by those tribes that remained primitive forest dwellers and hunters,

while the blowgun is a much more advanced weapon. Both the bow and the blowgun are designed to increase prehensility of the arm and both employ the aid of a natural force. The general culture level, however, of the Malay and his subjection to higher Asiatic cultures lend probability to the statement that the blowgun is a primitive Malayan weapon. Furthermore, the blowgun was found in general use among the Malayans along with the spear at the time of the arrival of the Spaniards. The blowgun is employed by some Negrito tribes but not by all. For instance, the Luzon Negritos did not use the weapon. In the same manner that iron weapons are used by Negrito tribes to-day whenever possible, they may formerly have acquired the blowgun. The primitive Negrito-Malay Batak and Tagbanua of Palawan, the pagan Bagobo, and the Yakan Moro of to-day use this weapon as did the Tagalog and Visayan tribes and other more civilized Filipino tribes of early Spanish times. The spear is probably older than the blowgun, as the simplicity of its construction in its most elementary form would seem to indicate. Originally tipped with bamboo, its shaft was usually constructed of the *palma brava* or of a bamboo with sharpened end. The notion of fashioning a hollow tube blowgun may have originated through the prior use of some hollow tubed spear. With the advent of iron culture and its more general availability for such purposes iron was substituted for the wood or bamboo spear head. Dr. A. E. Jenks writes that "the head-hunter's battle-ax replaced the spear and the sword in parts of the head-hunting area of northern Luzon. In this manner, tribal bent was definite. A group that used the ax employed it consistently and had no swords. The ax can not be said to be the earlier form; but it is that which prevailed among the more primitive tribes possessing least iron and least ability in its manufacture."

The distribution of weapons of offense other than the bow throughout Malaysia and more particularly within the Philippines follows no one general principle. Factors contributing to a great variety in design, type of weapon, materials, and ornamentation seem to vary with each locality and tribal group. The larger factors of cultural influence, scarcity, or presence of a plentiful metal supply, and occupational need or tribal bent combined with a preference or aversion to hand-to-hand fighting are in each group the deciding factors.

The spear was formerly in general use throughout the Philippines. The wooden spear or one with a bamboo blade gradually lost vogue as the supply of iron became cheap and plentiful enough to serve as a substitute material. The method of hafting seems to vary with the degree of knowledge of metal craft possessed by the individual tribal groups. In the northern sections of Luzon, in the Igorot

country, the usual method is to insert a metal tang into the wooden shaft. The place of junction is usually strengthened by an iron or braided rattan ferrule. An iron ferrule, spud, or cap is placed over the base end or butt of shaft for its protection, as it is customary for the individual owner of such spears to use them as a support staff in climbing the steep hills and mountains, and also for him to insert the spear butt end into the ground when resting or when engaged in some undertaking where the spear is not needed. Among the tribal groups of the southern islands where the knowledge of metal working is more advanced, the customary method of fastening the spear head to the shaft is by socketing. The spear or lance head has usually an iron ferrule attached to the neck constriction Into this opening the sharpened shaft end is inserted.

As a spear once thrown at an enemy can with difficulty be recovered it is sometimes customary to carry the spears in pairs—one for throwing at the adversary early in the fight while the other is retained for hand-to-hand fighting. This practice exists among the Jacanes of the interior of Basilan Island. Although tribal usage varies, it is generally understood that the fighting or war spears differ in their workmanship from spears for hunting and fishing, the latter being usually lighter in weight and longer shafted, while the shafts of the war spears, especially in the Bagobo country where they are not barbed, are elaborately ornamented with figured brass, silver, and braided rattan.

Among the Bontoc Igorot

the spear shafts are made by the owner of the weapon, it not being customary for anyone to produce them for sale. In some pueblos of the Bontoc area, as at Mayinit, spear shafts are worked down and eventually smoothed and finished by a flexible, bamboo knife-blade machine. It consists of about a dozen blades 8 or 10 inches in length, fastened together side by side with a string. The blades lie one overlapping the other like the slats of an American window shutter. Each projecting blade is sharpened to a chisel edge. The machine is grasped in the hand and is slid up and down the shaft with a slight twisting movement obtained by bending the wrist. The machine becomes a flexible, many-bladed plane.[5]

Spears of the Dyaks of Borneo, like those of the Philippine nationalities, are used for war and for hunting primarily, although ceremonial types occur. A difference lies in the barbing. The Dyaks, like the southern island tribes, place barbs on their hunting spears, while the tribes of northern Luzon prefer to place barbs also on their war spears. Occurrence of multiple barbs in the iron spearheads of the Bontok Igorot insure protection gainst "anitos" or evil spirits. Knight figures a series of old palmwood spearheads from the Philippines and Borneo which resemble the multiple barbed wood

[5] Ethnological Survey, Philippine Islands, vol. 1, p. 128.

spearheads from Fiji. Some of these are ornamental and resemble six diminishing ears of corn with a round final point. Others have sets of barbs in decreasing series also crowned with a finial point. Such spearheads resemble those made by the Melanesian peoples of the island archipelagos off the coast of New Guinea. It seems that, generally speaking, Melanesian influence was cast off by the southern island tribes in the Philippines together with the substitution of metal for the older types of wood and bamboo weapon forms. The presence of a wooden or bamboo spearhead on a weapon the shaft of which is a blowgun is much more rare in the Philippine Islands than among the Malaysian peoples on the south and west. The trident spearheads and the iron spear points in general use on the island of Timor resemble those of the Philippines.

Although all piercing weapons possess a point, there is great variety in the material of which the point is made, in its connection with the shaft, in the use of barbs, and, in the case of spears designed to be thrown, in the appliances for discharging. The greater the amount of effort spent in the shaping and finishing of the weapon, the greater the reluctance that it is parted with. Among the more primitive tribes of the world the spear is usually missile, consisting of a straight wooden pole running to a point hardened by fire, as among the tribes of New Guinea. In the Philippine Islands the spear is rarely missile and the spear thrower is unknown. Use of a spear as a harpoon in hunting is quite prevalent. Such spears are tanged rather than socketed. A lanyard is attached to the shaft and to the middle of the head, thus forming a toggle harpoon. Such a weapon is serviceable for use in the hunting of wild pig and is used by different Malayan tribes as well as by the Negrito in the form of a composite arrow and for the same purpose.

CATALOGUE OF TYPE SPECIMENS

Pike head, Moro.—The blade and socket are of cast brass. The lance head blade and guard prongs consist of one piece and are jointed to the socket by means of a metal tang that has been inserted into the socket for a space of 3 centimeters. The blade, guard, and socket are symmetrical and are etched throughout their entire surface with ornamental designs consisting of a continuous floral pattern on blade. The blade has slightly convex edges and a median ridge elevation from which the lateral surfaces slope to the two cutting edges. The guard consists of two bird figures supporting the blade; tail feathers constitute the guard prongs and a small pedestal base forming the socket. The socket has an ornamental pattern consisting of etched incised lines arranged in form of parallelograms and circles. The socket is cast with an octagonal surface.

Length of blade, 20 centimeters (7.9 inches); length of head from point of base of socket, 38 centimenter (14.9 inches). Collected by Arthur R. Fergusson. (Pl. 6. no. 4.) Cat. No. 324348, U.S.N.M.

Spearhead, Luzon Island.—The head and ferrule are polished and have never been used in warfare. The use of the weapon was probably confined to driving away bad spirits or "anitos." The blade has a blunt point formed by truncating portions of the tapered lateral edges near the point. The guard is formed by cutting away sections at base of blade and in drawing out the downward projecting guard prongs to extended recurved barbs. The blade and ferrule, which is a separate piece, are both unornamented.

Length of blade from point to tip of guard prongs, 39.5 centimeters (15.5 inches). Collected by Douglas N. Starr. Cat. No. 315724, U.S.N.M.

Spearhead, Igorot, Mountain Province, northern Luzon.—The blade is made of iron and has ferrule attached. Lateral surfaces of the spearhead are chamfered from a central median ridge which expands at the base into the rounded socket or ferrule. The blade is narrow lanceolate; no guard prongs are attached.

Length of blade to termination of cutting edges, 14.5 centimeters (5.7 inches); length of blade and ferrule combined, 23.7 centimeters (9.3 inches). Collected by Anthony J. Gies. (Pl. 6, No. 2.) Cat. No. 205501, U.S.N.M.

Spear, Moro, Mindanao.—The spear point is made of iron; it is heavy, well forged, has an acute point, elongated triangular lateral edges tapering gradually to the point. The widest part is just beyond the constricted neck, which is rounded in section and is prolonged into a socket ferrule inclosing the red lauan wood shaft. The shaft is shod with brass extending from the iron ferrule 20 centimeters (7.9 inches) up the shaft. The blade is unornamented, but has two grooved fillets paralleling the median ridge from the neck to their point of junction 14 centimeter (5.5 inches) from the point.

Length of blade from point to end of iron ferrule, 40.7 centimeters (16 inches). Collected by Mrs. James F. Courts. (Pl. 6, No. 6.) Cat. No. 292418, U.S.N.M.

Spear, Moro, Mindanao.—This weapon bears a close resemblance to the one just described, but embraces several variations in detail of construction. The blade is narrow, tapering to an acute point from a maximum width of lateral surfaces of 4 centimeters (1.5 inches) just above the slope of the truncated neck sector. The lateral surfaces are plain and chamfered from the median ridge to the edges. The iron tang is a continuation of the blade and is inserted into a wood shaft formed of yellow molave. The ferrule is constructed of an iron band 5 centimeters (1.9 inches) wide, which is welded about the shaft. Several bands of braided rattan ornament

the base of the shaft and aid in strengthening the tang end. The shaft is further ornamented by a tassel composed of fringed and braided red cotton cloth.

Length of blade from point to shaft, 39.4 centimeters (15.5 inches). Collected by Mrs. James F. Courts. (Pl. 6, No. 9.) Cat. No. 292419, U.S.N.M.

Lance, Moro, Mindanao.—Serpentine steel lance blade having five wavy crests. The blade resembles the kris dagger of the Moro and seems to be a late adaptation in the form of a lance as most of the Malay spears and lances for war and ceremonial purposes are straight edged. The neck is formed by constricting the lateral edges and expanding the median ridge into a ferrule socket into which the bamboo shaft is inserted. The shaft is ferruled with a band of brass 7.7 centimers (3 inches) long. There is a wooden bifurcate sheath for the blade composed of two hollowed slabs of a dipterocarp wood. The slabs are not glued together but are joined by banded splints of rattan at each end and at the center. The sheath is octagonal at the base.

Length of blade from point to point of insertion of tang in shaft, 31 centimeters (12.2 inches). Collected by Dr. Robert B. Grubbs. (Pl. 5, No. 4.) Cat. No. 3503, U.S.N.M.

Spear, Bagobo, Davao Province, Mindanao.—The spear is well made in the characteristic Bagobo style of weapon manufacture. Blade is of steel, has an acute point, median ridge paralleled with filleted grooves to their point of juncture 10.7 centimeters (4.2 inches) from the point. The truncated neck is formed by constricting the lateral cutting edges and expanding the median ridge into a circular ferrule into which the wood shaft is inserted. The socket is funnel shape, expanding toward the shaft. It is formed of a hardwood, *palma brava*, and is wrapped with a continuous brass wire of 0.3 centimeter diameter for a distance of 20.9 centimeters (8.2 inches) from the brass ferrule. Both the ferrule, which is 7 centimeters (2.7 inches) in length, and the brass-wire wrapping are ornamented with a pattern of punched figures. The blade sheath is formed of bifurcate slabs of wood covered with a paste-blackened cloth and banded splints of rattan.

Length of blade from point to shaft, 34.4 centimeters (13.5 inches). (Pl. 6, No. 7.) Collected by Misses E. H. and S. S. Metcalf.

Spear, Bagobo, Davao Province, Mindanao.—The blade and shaft are similar to that just described. The special skill and tribal characteristic of the Bagobo spears lie not in multiple forms of blades but in the variation accomplished in the ornamentation of the shaft. The ferrule is formed of highly ornamented brass, grooved and filleted, with filigree designs in rickrack and ogee curved figures

etched in transversely placed designs. The ferrule extends a distance of 12.5 centimeters (4.9 inches) up the shaft. Beginning at the ferrule and continuing a distance of 49 centimeters (19.3 inches) the shaft is wire wound, with brass wire punched in ornamental designs and figures. The remainder of the shaft is shod with alternate bands of brass and silver. Each band is fixed in position by small brass rivets and a grooved depression on the surface of the shaft into which the two joined and looped ends of each band are punched before riveting. The shaft cap or spud is formed of hammered brass wire. The shaft tapers from the blade end to proximal end so that the bulk of the weight lies near the blade, and accuracy of flight is insured.

Length of spear shaft and blade, 1 meter 97 centimeters (75.7 inches). Collected by Misses E. H. and S. S. Metcalf. (Pl. 6, No. 12.) Cat. No. 286260, U.S.N.M.

Spear, Bagobo, southeastern Mindanao.—In this weapon as in other Bagobo spears the blade and shaft approach a definite type showing long acquaintance with brass, also the development of an ornamental technic that rivals the most excellent metal craft of any Malaysian tribe, including the Moro. The blade and shaft are similar to the spears just described in design, materials employed, and in ornamentation. Detailed variation is in the ornamentation of the brass ferrule which here takes on an intricate scrolled pattern alternating with a banded rickrack border. Braided rattan wrapping takes the place of the brass wire wrapping of other Bagobo spears described. This applies also to the sheath which is capped with a figured brass button and wrapped with an open-work lacing of rattan splints, except at the basal end, where the rattan splints are braided into a close twilled weave.

Length of blade from point to ferrule, 35.6 centimeters (14 inches). Collected by Misses E. H. and S. S. Metcalf. (Pl. 6, No. 8.) Cat. No. 286256, U.S.N.M.

Chevaux de frise, path splinters, and pitfalls.—A custom practiced by all tribes of the Philippines is the placing of bamboo or palmwood spikes to impede the progress of an enemy or in the capture of game animals. Jenks writes that sharp-pointed bamboo spikes are often stuck in the trails by war parties returning from some expedition when retaliation is expected on the part of the victimized group. The spikes are placed along the trails at an angle and protrude to a sufficient height to pierce the unwary in the groin or upper thigh. This is the type of spike used by the Ibilao of southeastern Nueva Vizcaya Province. A shorter spike, used by the Bontok group, is designed to pierce the bottom of the feet or to

stab the lower leg muscles. Many hill tribes nightly place small poisoned slips of bamboo, stuck freely with the points uppermost about the paths near villages. These weapons are known locally as *panjis* or *puas*. Museum Cat. No. 257720 includes one lot of bamboo sticks such as are placed by the Moro of the Lake Lanao region in pits and deadfalls to wound or to kill their enemies. These sticks were taken from a pitfall placed across a forest trail; they average from 52 centimeters (20 inches) to 62.4 centimeters (24 inches) in length. Collected by Chaplain Joseph Clemens, United States Army.

Short sections of palmwood or more often of bamboo, are set up in runways of animals and at river fords to pierce the feet of animals so that they will become easy victims to the hunter. The use of such weapons known as "suga" to the Kalinga of the Mountain Province, and as "luk-dun" to the Ibilao is known also to the Apiao, Negritos, Igorot, Moro, and the Ifugao. The splinters are tapered at both ends and have incised tribal markings along the lateral surfaces.

Length of splinters, 52.4 centimeters (20.6 inches); diameter at center, 1 centimeter (0.4 inch). Collected by D. B. Mackie. Cat. No. 292498, U.S.N.M.

An extract from the diary of Don G. Galvey, in command of the forces for the suppression of contraband trade, as published in "Informe Sobre el Estado de las Islas Filipinas en 1842" relates how a Spanish expedition following the bed of the Aringay River encountered armed Igorot forces who had protected themselves against the advance of the Spanish by inserting in the trail leading to their country numbers of very sharp-pointed pieces of bamboo, and some of *palma brava* (*Corypha minor*), driven into the ground, and with deep pitfalls covered with grass and furnished with bamboo spears in the center. There was also another kind of trap, called "balitil" by the "pagans," which is made by placing two drawn bows with arrows ready to let fly concealed in the high cogon grass, one at each side of the trail. From these bows a small and well concealed string leads to the path, and when this string is trodden on, the two arrows fly off with such force as to pass easily through a carabao. Of these arrows, some are aimed so as to hit the body, others the legs.

A similar invention is also employed in the capture of deer and other game by various peoples throughout Malaysia. The trap is usually placed in an animal runway that is so narrow and walled in with underbrush as to confine the animal to the pathway where the trap is set. The trap usually consists of a string of rattan placed across the pathway which the animal strikes. A spear resting on a forked support having a strong spring of flexible wood

at the nock end is impelled forward impaling the animal when the rattan cord holding the flexed spring is touched by the animal. The term applied to the weapon in the Philippines is "belatic." The term applied to it by the Sakai is "belantic," while a Malay term for the same invention is "belante."

The many bird and fish traps that are in use by the Negritos and Filipinos are primarily of basketry and fiber construction and need not be referred to in this connection. They are ingenious devices and quite effective, but are rather examples of the native skill in weaving flexible materials and of the loomless handicrafts than of weapon types.

Caltraps.—A variety of other piercing weapons of the spear type comes under the general head of caltraps. These weapons consist of an oval or elliptic core usually formed from hardwood which has inserted in it and projecting in all directions like the spines of a cactus a number of hardwood spikes. Like the various other forms of path splinters, the caltrap is placed in the runways of wild animals, also in the pathways frequented by men, concealed under leafy foliage so as to penetrate the foot in such a manner that the injury impedes the escape or progress of the passerby. Such weapons are usually not more than several inches in length and have a diameter of but 1 or 2 inches. The projecting spines range from 2 to several inches in length. A large collection of caltraps was exhibited at the Louisiana Purchase Exposition at St. Louis in 1904 by the Philippine government board.

BLOWGUN OR SUMPITAN

Distribution and function.—The blowgun is primarily a forest weapon. Its use against man or the larger beasts of prey is practically unknown. The reason for this is to be sought in the structure of the weapon and in the nature of its missiles. It is preeminently an effective weapon against small birds or other small animals, such as monkeys, where stealth and absolute silence are required to make a shot effective. A native walking along a forest path can detect from the traces left on the ground, such as fragments of nuts, etc., the presence of game birds or monkeys high up in the tree tops. A shot from the blowgun may become effective, the game bagged, and the hunter ready for the next opportunity all in perfect silence. This is possible, as the poisoned dart causes no outcry as would be the case if some other missile were employed.

The darts are always light and their range short. A pith or cotton plug causes the dart to fit closely to the tube—a necessity, as the missile depends for its expulsion from the tube on the sudden release of compressed air from the mouth of the operator.

The blowgun has enjoyed a wide distribution in the past, though it survives chiefly in Borneo, Malay Peninsula, and in northern South America. The principles involved in its construction and operation seem to imply that it is a weapon of quite ancient lineage and represents a wide range of diffusion. Although primarily a forest weapon of Malaysia and tropical America, it formerly appeared on both the east coasts of Asia including Japan, and in eastern North America as far north as the area occupied by the Iroquois. The American form consists essentially of two grooved halves fitted together with nicety and wrapped with spiral lashings of flexile basketry material, then coated with wax on the outside. The more common form of blowgun occurring in Malaysia consists of two tubes, one inside the other. The inner tube is formed from an unjointed reed placed within an outer palm or bamboo tube and joined with wax. A basketry wrapping cover and the American type of grooved tube are not unknown.

Use of the blowgun by the Negrito.—As employed by the Negritos, such as the Batak of Palawan, the blowgun is subsidiary to the bow. When hunting for fresh meat, Negritos will send a pack of dogs skirmishing into the forest until a deer is startled from cover. As it dashes wildly by, the little forest pygmies shoot at it with missiles from their bows or blowguns. The deer continues running pursued by dogs until it falls. Before consuming the meat, however, the priest "babalian" or headman offers the entrails to the spirits that have rewarded their efforts.

The blowgun is an effective weapon in the hands of the Negrito in obtaining such game as birds and monkeys. Like the primitive users of the blowgun in South America and Malaysia, the Batak relies on stealth and the effect of his poisoned darts to temporarily paralyze the game that he has silently approached. The poisoned darts are alkaloid and the poison is supposed not to contaminate the flesh of the animal shot. A pygmy Batak will aim his blowgun at a monkey in a tall tree, and with a sudden puff of air from his lips send the dart on its way. The monkey may seemingly remain uninjured until the poison takes effect when it drops to the ground. Larger game with thicker skins must be killed with an arrow which can penetrate more deeply. The nomad Negrito possesses bows of excellent workmanship, which together with his quiver of arrows and his other weapons consisting of blowgun and darts, a knife, and a bolo or two, constitute his most valuable and practically his only possessions.

Parts to be considered; methods of manufacture.—The various parts of the blowgun to be considered in this review of its varieties employed in the Philippines are sights, whether one or two; spear

attachment, if any; mouthpiece; vent piece; outer casing, together with ornamental decoration, if any; lining; winding; wrapping; plating; and cement. The varieties that are produced in the Philippines may be classed as either simple, having but one casing or tube, and compound; either of these types may be constructed of wood or of several joints or nodes of bamboo.

Methods of manufacture vary. Some of the following are known in the Philippines: Knocking out septum of the jointed bamboo; boring; burning; halving of wood into sections and excavating or hollowing; boring of tube out of the solid.

With regard to function, points that must be considered may be grouped under the headings of use in hunting and in war; range; accuracy; speed of projectile; force of breath employed; use as a spear; distance penetration.

The blowgun, "sumpitan" (Malay), is a remarkable weapon in many respects, and especially because it is one of the few inventions of uncivilized peoples utilizing the force of compressed air; others being the popgun, the fire piston, and the piston bellows. It appears that these inventions are coterminous in range and are products of Malay inventiveness. The blowgun originated in a zone where canes and bamboo flourishesd, consequently of necessity in the Tropics. Its use was formerly rather extensive in southeastern Asia, eastern and tropical America, but was not diffused in Polynecia, Melanesia, or Micronesia, although some aboriginal black pygmy tribes in Malaysia use it occasionally.

CATALOGUE OF TYPE SPECIMENS

Blowgun, "Sumpit," Batak, near Punta Tiniatia, central Palawan.—The tube consists of an outer casing of bamboo, tapered slightly toward the muzzle, finely decorated with etchings burned into the surface. The decorative design consists of a broad spiral band; intervening spaces between the spirals are filled in with short horizontal lines. The tube is lined with a straight, even-bore tube of cane. The mouthpiece or muzzle is bound with three neatly braided bands of rattan, each band 1 centimeter wide. The forward end is coated thickly with beeswax in which is set a graduated strip of bamboo, giving the elevations for sighting the blowgun. While sights are commonly employed on blowguns, this type of elevation sight is peculiar to the Batak.

Length of blowgun, 158.6 centimeters (61 inches); diameter of bore, 1 centimeter (0.4 inch). (Pl. 2, No. 5.) Cat. No. 232293, U.S.N.M. Collected by Gov. E. Y. Miller.

Quiver and blowgun darts, Batak, Palawan.—The quiver is a joint of bamboo, with a cap or lid of the same material; the quiver is an old one, and is highly polished from use and age. Around the base

is a band of flat carving; around the body of the quiver pass three woven bands of plaited rattan, holding fast the fork designed for thrusting in the belt and the cord for securing the lid to prevent its loss. The fork is of fine-grained wood resembling ebony and is carved in the round in the form of a crocodile, whose head extends the length of the lid. The bands are held taut by splints of bamboo which are thrust under them. The lid is finished with a braided ring set in a groove cut in the margin. A cord loop is swung from the fork as in some of the Dyak specimens.

Length of quiver, 36.4 centimeters (14.3 inches).

The darts consist of (*a*) thin-pointed slivers of bamboo, some of them poisoned and all with short conical pith base. Length, from 20 to 30 centimeters (7.9 to 11.8 inches); (*b*) with heavier shafts and heads cut in the material forming two square barbs; these are sometimes poisoned; (*c*) like (*b*), but with quite small heads and more slender shafts; (*d*) a dart having a cord attached just below the head and wound spirally around the shaft, terminating above the pith base. This was probably intended to produce a spiral motion in the flight. Length, 28.5 centimeters (11.2 inches); length of (*c*) 25.5 to 30 centimeters (10 to 11.8 inches); of (*b*), 25.5 to 30.5 centimeters (10 to 12 inches). The pith base of all the different types of darts is 1 centimeter long and all have the same diameter. The total number of darts in the quiver is 22; there are two extra pieces of pith. Some of the darts have a small caliber pith base; such darts are regulated by a packing of down from a palm. The Bagobo use tufts of fiber instead of pith on their blowgun darts, while the Moro employ plugs of pith.

Collected by Gov. E. Y. Miller. (Pl. 2, No. 7.) Cat. No. 232288, U.S.N.M.

Quiver for blowgun darts, Batak, Palawan.—This quiver is a joint of bamboo. The silicious epidermis has been removed from the surface except on a small area near the top. The cap is also of bamboo, banded with braided rattan hoops, three in number. To the side of the case is attached by means of turns of a rattan withe a carved wood fork which is thrust in the belt; this fork is narrow and has a long tang compared with the Bornean specimens. The quiver contains darts, pith, and a poison spreader. The darts are of two kinds, one long and rather heavy with two barbed points shaped from the wood of the shaft; the other with slender shafts. two barbed heads deeply nicked at the base, designed for breaking off in the wound; all have small plungers of fibrous pith. The shafts are marked with numerous horizontal scores in which a black gummy substance has been plastered. Length of darts, 32 to 35 centimeters (12.6 to 13.8 inches). The longer darts are in process,

while the completed darts through handling have nearly all lost the barbed head. The poison spreader is a spatula cut from bamboo and is 28.5 centimeters (11.2 inches) long. The substance used for the bases of the darts is the stem of some grasslike plant. In the hollow base of the quiver is stored the dammar gum used to polish the shafts of the darts.

Collected by Gov. E. Y. Miller. (Pl. 1.) Cat. No. 232289, U.S.N.M.

Blowgun, Tinitianos or Batak, Palawan Island.—This weapon is made of two long joint sections of *cana boho* and is decorated at the proximal end section with parallel burned lines interspersed with etching in hour-glass figures. Mouthpiece end is hooped with rattan and is covered with beeswax. The muzzle is also covered with beeswax. The lining consists of two joints of cane accurately fitted to the tube which acts as a jacket to keep the lining straight. The outer tube is hooped with four bands of bamboo.

Length of tube, 218.4 centimeters (84 inches); diameter of bore, 1.1 centimeters (0.4 inch). Collected by Gov. E. Y. Miller. Cat. No. 232292, U.S.N.M.

Blowgun, Moro, Mindanao.—The tube is of bamboo lined with another tube of smaller caliber. Similar tubes are kept straight by a cover of vertical splints of bamboo applied edge to edge the entire length of the tube and held by a continuous wrapping of rattan strip. The mouth end is covered with a wooden tube, also lined with bamboo, fitted to the surface of the lining tube. At the muzzle end two sights are secured by a lashing of rattan, resembling in this respect the blowgun of the Dyak.

Length, 241.8 centimeters (93 inches); diameter of inner tube, 1 centimeter (0.4 inch).

The dart operated in the blowgun is a strip of bamboo formed into a triangular head at the forward end. To the proximal or tapered small end is fitted a cone of pith held in place by a wrapping of fine lashing fiber at the junction of the pith and shaft. The points of the dart are stuck into a cylinder of pith to protect them.

Length, 46 centimeters (18.1 inches); length of head, 5 centimeters (2 inches); length of pith, 3.5 centimeters (1.4 inches); number of darts, 15. Collected by Col. Frank H. Hilder. (Pl. 1.) Cat. No. 216838, U.S.N.M.

As the blowgun is noiseless, a poisoned missile is especially effective in hunting game where a stealthy approach is not easily secured, as in the hunting of birds, monkeys, and other arboreal game, Dr. E. R. Hodge saw a native of Angeles, Pampanga Province, Luzon, using a long plain blowgun for killing birds. At this point, less than 50 miles from Manila, it is impossible that natives found themselves

unable to procure other more modern weapons, but found to the contrary that the blowgun was the most effective weapon under the circumstances. The Moros also still employ the blowgun. Col. Frank H. Hilder brought several blowguns from the island of Jolo which were made of wood and wrapped with split rattan. The blowguns brought back to the United States by Mrs. Florence G. Miller from the island of Palawan are mostly made from bamboo and are beautifully decorated with a surface decoration of burned rings. One of these weapons has attached at its muzzle an iron spearhead. The employment of such combination projectile and close-contact weapons by the Batak of Palawan is not unusual. Cat. No. 326032, U.S.N.M. Gen. Jacob Kline, United States Army, presented to the Museum a blowgun made of two hollowed pieces of wood joined and wrapped with fine cord. A peculiarity not found in any of the other tubes is in the mouthpieces of pewter. Cat. No. 313960, U.S.N.M.

While most of the darts are fitted to the lining or walls of the tube by means of conical sections of pith, other material is used in the long darts collected by Capt. J. R. Harris in the Cotobato Valley in 1904. These darts have wrapping of native tree cotton covering the posterior half of dart similar to the darts made by the South American Indians. The head is tipped with an iron point having one barb.

Length of dart, 55 centimeters (21.6 inches). Cat. No. 283002, U.S.N.M.

METALLIC HAND WEAPONS FOR CUTTING AND PIERCING: THE PARANG, THE BOLO, AND THE DAGGER

Distinction between the parang and the bolo.—In classifying swords and metal blades employed by the Filipino it is necessary to distinguish between the fine blades "parang" of many varieties of use and intricacy of design made by the Moro and the combination implement-weapon or bolo in general use among the northern civilized Filipino tribes in Luzon and in the Visayan Islands. The bolo is a combination weapon and tool, usually unornamented as to blade or handle and has but one cutting edge, widening rapidly in section toward the back. The distal end of blade is usually abruptly truncated, though a pointed bolo resembling the leaf-shaped parang is employed among certain tribes as a weapon of personal defense for thrusting as well as slashing. Sporadic efforts were made by the Spaniards to enforce a law compelling the natives to break off the points of their bolos, consequently bolos with truncated distal end are frequently found among the older collections of Philippine weapons.

The many types of Moro swords (generalized term "parang") and daggers are variants either of the wavy kris or of the Malay cutlass, variously known as the barong or parang, a lanceolate leaf-shape blade, short, single edged, and thick in section toward the back, resembling somewhat a bolo. The older Malayan weapons, such as the parang-ihlang or kampilan, a long straight single-edged sword with recurved spikelet at the distal end of blade and with huge semicircular guard; the parang-latok; the talibong; and the curved beheading sword, with long recurved blade, wide at its truncated distal end and provided with long unornamented handle usually with double grip; a variety of daggers either curved, straight, or wavy, double-edged, and grooved along the median ridge, together with many different forms of the straight or wavy kris-dagger, are among the more well-known weapon types belonging to the Mohammedan Moro. Handles are sometimes recurved and weighted to balance the length and weight of the cutting blade. Handles are of wood, horn, bone, ivory, silver, or other metal and may be beautifully ornamented with geometric or conventionalized animal or bird figure carvings. Braid of silver cord or of rattan alternate with inlaid silver repoussé work. In the same manner in which it is possible to trace all of the types of Moro weapons to elementary prototypes, it is similarly possible to trace all decorative design both on blade and handle to simple elementary patterns. As has already been indicated, Moro weapons are typical weapons of western Malaysia such as were first produced under endemic, and then under Hindu, and later under Arabic influence, but are to-day characteristic not only of Malays adhering to the Mohammedan religion but of the pagan tribes of Malacca, Celebes, Borneo, and Java as well.

Two generalized types of Philippine swords.—In general, it may be said that all Malayan weapons are derived from one or the other of two sources—a slender curved swordlike combined cutting and thrusting weapon or cutlass of the seafaring Malay which may be traced back to the Turkish and Saracen blades and, more remotely, to the European saber with its fulcrum in the handle grip: and, second, to a heavy, slashing weapon which is much older and more native to Malaysia. This weapon is usually slightly curved, having a convex cutting edge and a heavy blade back. Such a weapon with fulcrum near the distal end of the blade is a typical jungle knife and may easily sever a banana or bamboo trunk with one blow. This form of weapon has developed into various types, depending on the occupational need, the tribal bent, and the cultural demands, into the barong, the bolo, forms of the parang such as the ihlang, the latok, and the beheading or executioner's blade. The first type has

developed into the kris and kindred double edged swords, knives, and daggers, and is primarily the weapon of the seafaring, warlike Moro and kindred peoples. Knives and daggers have in time become as completely altered as individual preference and the artistic tendencies of the maker could devise. For the kris and the dagger have become weapons for display and the insignia of rank. The blade becomes itself a mark of caste through the elaborateness of design and the wealth of precious metals that may be lavished in its ornamentation. It may be of simple design and it may have embodied in its blade, ornamental grip, pommel, and scabbard a value of hundreds or even thousands of dollars in skilled labor and in precious metals and stones. The Malay kris has thus assumed a position that makes of it more an insignium of rank than a useful weapon, although throughout Malaysia forms of this weapon, usually daggers of ancient origin, occur as typical, useful folk weapons. Variety of form is manifested in the carrying position of the blade. This may vary from a position on the back between the shoulder blades; across the back; at the side; insertion in the belt at the front, either up to the hilt or with the insertion of point only, or resting in the scabbord in the belt either horizontally or vertically. One form of dagger, the "balarao," is carried in the belt with the point of blade upward.

According to Knight (Savage Weapons at the Centennial Exposition) one form of kris is used as a thrusting weapon in executions.

> The culprit or victim, as the case may be, sits in a chair, and his extended arms are held by two persons. The executioner stands behind and places the point of the kris just by the left collar bone, and strikes it downward, piercing the heart. If he be fastidious he places a pledget of cotton wool around the point of the kris before thrusting it into the thorax, holds it there tightly, so as to wipe the weapon on its recovery, thrusts the wool into the gap, and thus avoids shedding a drop of blood.

The kris (Anglicized creese) occurs in two lengths, either the sword or dagger, and may vary from a few inches to 30 or more. In the sword type the edges of the blade are essentially parallel, though this is rarely the case in the shorter dagger lengths, which are tapered to a point. One cutting edge always has one more wave than the other. This is due to the fact that the wave crests are never directly opposite one another. This gives the blade the peculiar serpentine outline. Even the straight-edged krisses rarely appear straight in their axis, as there is always a certain curvature which permits the striking of a drawing blow.

The base of the blade is widened into a guard and contre guard, of which the section forming the guard is in part an enlargement of the blade proper and in part a separate piece. The tang passes through an aperture in its center. The more recently produced

krisses, the guard piece, is welded to the blade proper, although in the older types the base piece or guard is so accurately fitted to the base of blade as to appear to form an integral part of it. Both guard and contre guard are characteristically notched and pierced. The kris is held in the hand with guard up. Thus the notches may serve to catch the edge of the enemy's blade, while the irregularities and ornamentations of the contre guard represent, according to some writers, the conventionalized jaws and fangs of a serpent. Knight says that the perforations in the contre guard represent a record of the number of enemies slain.

The more recent specimens of krisses are produced primarily for sale to tourists and are made from any suitable available material. Wagon tires are sometimes used. The kris made from such material is shaped, wave crests and all, within the space of a few hours. Wagon springs are preferred by the native smiths, since the shape of the leaves and the better grade of steel make them more suitable for being wrought into swords and blades of various types. The older and better kris specimens are easily recognized not so much by the quality of steel, but in the quality of workmanship displayed on pommel, handle grip, guard, and stirrups. In the United States the larger collections of superior krisses are to be found in the Field Museum, Chicago; the Peabody Museum, Salem; and the various other larger museums, including the National Museum.

Social significance of the bolo.—The point has been raised by writers that once a ceremonial or war weapon has reached a position of differentiated structure and function its use for purely agricultural and domestic purposes becomes taboo. This statement has been much overemphasized. With the exception of the more ornate barongs, krisses, and daggers of the Moro, there is not a single weapon employed by the Filipino that is not at times also employed in the industries. This is true of the sword weapons, parangs, and bolos, no less than of the head-hunter's equipment consisting of the head ax and head basket. Thus the head basket may alternately be used as such or as a common pack basket, while the recurved spike of the head ax may be thrust in the ground and the projecting ax be used as a stationary knife or adz. The sharply recurved parang-latok may be used as a common zacate grass cutter, while the beautifully shaped barong blade becomes a common jungle knife. Differentiation and specialization in structure and function are more local and personal in primitive society and weapons never reach the degree of specialization in function that applies to the dueling sword or saber in our own civilization.

Referring to the bolo of the Filipino, Doctor Hawley states that the bolo proper, with handle cut from the horn of the carabao and blade hammered out of a piece of steel, has given the generic name to all classes of the weapon.

Every Filipino has his bolo. It enters into his home life and marks his social and professional rank. A Filipino who has risen to the rank of an officer in the army preserves carefully the bolos which he has acquired in his upward career. At home, the bolo is kept in a place sacred to itself, usually over the door of the main room. It enters into the religious life of the Moro, and before its home niche men and women perform sacred rites. The best are manufactured in Mindanao. The classification of the social and professional significance of the arm by the Moro of Mindanao is tacitly accepted all over the Philippines as official. Officers and men of importance in the Filipino Army and government accept this classification. The bolos are made by hand, and the workmanship is so ornate and beautiful that is compares favorably with the best work of the European armorer.

This was written over two decades ago, and the extent that the statement is no longer applicable is a measure of the acculturation that has been brought about in the material and social life of the leading Filipino nationalities. In a similar manner it appears that the sword as a weapon is becoming more and more obsolete as the science of warfare progresses. To-day officers' swords are no longer sharpened; the function of the weapon has changed from that of an efficient weapon in the duel and in fencing to that of a symbol of rank and command. In flourishing the weapon while executing a command, there is danger that it might cut the officer's own men, and the precaution mentioned is taken.

Vocabulary of Philippine metallic hand weapons.—In classifying various Malay and Filipino swords it is necessary to note the double usage of the term "bolo." In a general sense the term is applied to all Malayan sword weapons in a manner similar to the term "parang"; in a more specialized sense the term includes only those weapons which are at the same time agricultural tools or chopping knives like the "machete." In this sense the term is more particularly applicable to the implement in general use throughout the northern islands and in the Visayas, the Moro having a different specialized form of jungle knife and implement weapon which is abruptly curved at almost right angles, enabling the operator to cut and to chop objects lying on the ground.

The following list is only a partial classification of hand weapon types, but includes the more important and those most commonly included in collections:

Balarao.—The Mandayan dagger of that name is local in the Agusan Valley, Mindanao. The blade is an elongated, hastate form, having an iron tang that passes between the fingers of the hand. The weapon is worn concealed and is grasped in the everted hand.

Barong.—A short length, leaf-shaped, ornamental official bolo. Carried by holders of political office and by Moro dattos, sultans, and other officers of political rank. It is not a fighting weapon or of any practical use. Its origin is unknown.

Bolo.—A double cut and thrust weapon. The weapon is short, has a broad lanceolate blade, and slightly curved handle. Generally distributed in the East Indies and Malaysia.

HAIRY KAMPLIAN.—This weapon denoted considerable rank on the part of the bearer. It is ornamented with a tuft or tufts of human or horse hair at the sides of the handle. The wooden handle is large, highly ornamented with carvings; bifid pommel. The large wooden cross guard is often provided with sword breaker and wrist protector. Moro. Weapon not essentially Filipino, but introduced by way of Borneo. North Bornean forms resemble it, as do also the north Celebes types with spur point at distal end. The weapon resembles the parang-ihlang.

HEAD AX.—The head ax is most developed in the Philippines. It is found in two areas—north Luzon, among the hill tribes "Igorot", as Apiao, Bontoc, Kalinga, and according to Dean Worcester, also the Negritos of northeastern Luzon; and Mindanao, among the Moro and other near-by tribes. It is not developed to such extent elsewhere, but its growth seems to have been from the Dyak chopper through the talibong. The Igorot head ax, which may be taken as a type, is squarish with short proportions; the Kalinga axes are more slender, curved, and have longer spur; the handle spur is usual, but is often omitted by the Moro ax maker. The Apiao and Negrito types often take the deeply concavo-convex form of a crescent with the cutting edge on the under or convex side. Hafting is uniformly effected by means of tang and ferrule of iron. Socketing is unusual.

INSURRECTO WEAPONS.—There are many examples of sword types with guards, sword breaker, grip, and scabbard of foreign and modern type, usually Spanish. These vary in shape from the Toledo blades of the Spanish to the ordinary bayonet-dagger type as found on modern Army rifles. Such weapons are easily recognized as modern in design and of non-Filipino origin by the leather scabbard, the machined and curved cross guard, the quality of the steel blade, its workmanship and design, and by the handle grip which, if genuine native production, is the most typically Malayan feature, but which, if of recent production under foreign influence, shows most traces of acculturation.

KAMPILAN.—A long blade widening to a truncated distal end. The weapon is employed by the Moro private soldier. Large wooden handle sometimes highly carved. Sword breaker and wooden cross guard always present.

KRIS.—A badge of leadership either in the field of battle or politically. The blade is double-edged, is either straight or wavy, and is usually ornamented both as to blade and handle. The blade has a wide distribution throughout Malaysia and southeastern Asia. Some of the older forms are ceremonial in usage, others are merely for lavish display of wealth and rank. The origin of the kris is, like that of the barong, unknown. In the Philippines it is practically unknown, except to the Moro of Mindanao and of the Sulu Archipelago.

KRIS DAGGER.—The most ancient form of side weapon. The usual type occurs with wavy blade and wooden, ivory, or horn handle set at right angles to the blade. The number of wave crests is usually greater than on the wavy kris. Ornamentation of handle is invariably a zoomorph in design and resembles the form of a generalized serpent or mythical creature resembling in some respects the dugong or sea cow. The carving in the round incorporates the entire handle as a part and is more realistic than if a purely surface decoration.

PARANG-IHLANG.—Long, straight blade resembling the kampilan, widening toward the distal end, which is usually truncated at a slope from the back toward the edge. The design on the wooden handle is usually a conventional zoomorph. Moro weapon after the fashion of the Kayan of Borneo.

PARANG-LATOK.—The parang-latok resembles the ihlang in most features, except that the blade is sharply curved at an angle of nearly 30 degrees to

the handle grip. The slope at the truncated distal end is inward from the back to the edge, while in the ihlang the slope extends inward from the edge toward the back.

PIRAH.—Broad backed deeply concave blade, having a single, convexly curved cutting edge. The blade is usually truncated, forming a long slope from the back to the long, acutely tapered point. The elbow at base of blade is nearer the handle than in the similarly fashioned parang-latok. The handle, fashioned to fit the hand, is of figured wood or horn and is provided with symbolic recurved horns and spike. Southern islands.

PUNAL-DE-KRIS.—A dagger carried by women and children of any social pretensions; the blade may be either straight or wavy like a kris; it is usually of good quality of metal and may have blade and handle hammered from silver or gold. Moro.

QUINBASI.—A general utility blade of Moro production. Used by the common soldier.

SUNDANG.—A working bolo; also a weapon used by the common soldier. As an insignium it places the bearer in the laboring class. An agricultural implement in Luzon and in the Visayas.

TABAS.—A heavy chopping blade convexly curved at cutting edge and concave at back. The blade broadens to ward the truncated distal end. The long curved handle serves as a counterweight for the long heavy blade. It is usually wrapped with braided rattan. In general effect, the blade resembles a scimiter. Moro, Mindanao, and Sulu Archipelago.

TALIBONG.—The blade is from 4 to 5 feet in length and gives the bearer considerable social distinction. It is used in the advance line of attack and also by the official headsman, who formerly decapitated the wounded upon the field of battle. It is a double-curved sword mounted on a long handle. Has a certain resemblance to the Japanese headsman's sword or ax.

TERCIADA.—A kris with straight or slightly curved blade having less ornamentation than the true kris. Worn by those of lower rank and less wealth.

TOTEMIC TYPES.—The totem type, with grotesque human head figurine carved on wooden handle, is produced in the Visayas, usually in Cebu Island. A somewhat similar sword with Javaneselike handle carving, apparently of a fabulous being or Wayong, also originates in the same area.

Type weapons and models.—Many individual collections of Philippine weapons contain shields displaying miniature weapons of the types ordinarily produced by the Moro, also by the Luzon Island and Visayan tribes. These models mounted on a wooden shield are made of bone, ivory, wood, wire, and other materials; sometimes such shields are merely for sale to tourists. The type models displayed often contain examples never encountered in museums or in private collections. It is probable, though, that such specimens actually exist and that the imagination of the toy armorer is not overworked. An analogous instance is found in the Burmese Dah, which has 70 known forms from which the applicant for a sword can choose to have one fashioned.

The Museum collections contain several type models. One of these consists of type handles of bolo; these models are from Cabanatuan, Iloilo, and represent conventionalized "totem" type handles of wood construction, spoken of as the "tiger head," so often found

on the handles of Visayan blades. A similar grotesque type of human head carving resembles somewhat the Javanese type of handle carving and represents apparently a fabulous being or Wayong. This type is especially common in Cebu.

Cat. Nos. 288432–3, U.S.N.M. Collected by E. H. Hammond.

Several shield trophies representing models of arms, implements, and typifying the workmanship of the Igorot, Tagalog, and Moro smiths were collected by Frank F. Hilder. The shields are made of wood, covered with red cotton cloth and contain mountings of 26 weapon types manufactured by the Tagalog of Luzon and 64 models of Moro arms. The models are made of steel and have ivory and bone handles.

Cat. Nos. 216842–3, U.S.N.M. Collected for the Government board, Pan-American Exposition.

The list of names of model types which accompanied the models of specimen types is complete. The catalogue of models is given here:

Catalogue of collection of Moro arms

1. Cabil.
2. Ompac.
3. Tanculo.
4. Paruar.
5. Capipis.
6. Pamale.
7. Sia.
8. Corang.
9. Agong.
10. Togo.
11. Togoiran.
12. Cotlong.
13. Pamarang.
14. Sayap.
15. Sayapi.
16. Colingtan.
17. Pauli.
18. Busoc.
19. Tunot.
20. Lantaca.
21. Dantunot.
22. Sabilulan.
23. Dampig.
24. Yrong.
25. Moro mindanos.
26. Taming.
27. Calasac.
28. Lunar.
29. Mimpil.
30. Duyar agong.
31. Duyar colingtan.
32. Duyar sabilulan.
33. Lugay cotlong.
34. Tombag.
35. Dilo.
36. Tinagoo.
37. Budiar.
38. Pisao.
39. Pangogam.
40. Kilapris.
41. Alina.
42. Compay.
43. Saganat.
44. Kris.
45. Talibong.
46. Lanti.
47. Badong.
48. Zayang.
49. Ligua.
50. Sipul.
51. Puro.
52. Tinamban.
53. Aguial.
54. Kris.
55. Tabas.
56. Campilan.
57. Dalupani.
58. Singari.
59. Badao.
60. Balasion.
61. Narani.
62. Sandata.
63. Carimay.
64. Tupat.

Another smaller shield contains 25 mounted miniature types of Igorot weapons and includes bolos, spears, knives, head axes, bows, and arrows. The shield was collected by Anthony J. Gies. Cat. No. 205509, U.S.N.M.

DESCRIPTION OF TYPE SPECIMENS

Barong-bolo, Bagobo, Mindanao.—A double cut and thrust weapon. The blade is slightly concave at the back and convex at cutting edge like the outline of a lanceolate-shaped leaf; greatest width lies near distal end of blade. Double longitudinal grooves occur on both sides of median ridge on both lateral surfaces of cutting blade. The handle is recurved like the handle butt of a pistol; grip is broad and short but fitted to the hand; it is partly shod with a cast brass ferrule having projecting spur guard, and is ornamented with geometric incised lines.

The wood scabbard is straight, overwoven with braided tape on upper part; lower part is blackened. Scabbard terminates in 3 feet wound with punched brass coils.

Length of blade, 47 centimeters (18.5 inches); blade width, 4.8 centimeters (1.9 inches); handle length, 14 centimeters (5.5 inches). Collected by Maj. H. G. Lyon, United States Army, from Bagobo, Mindanao. (Pl. 12, No. 7.) Cat. No. 275709, U.S.N.M.

Bolo.—A cutting blade with sharp point and straight cutting edge, convexly bowed at back. Lateral surfaces of blade plain except for a series of transversely incised lines at blade neck. Pistol-shaped handle of horn. Iron ferrule 1.2 centimeters (0.5 inch) at neck. Geometric etchings in parallel and diagonally incised lines on grip and pommel. Pommel shod with iron.

Length of blade 66.5 centimeters (26.2 inches); length of handle, 17.5 centimeters (6.9 inches). Collected by Douglas N. Starr. Cat. No. 305662, U.S.N.M.

Bolo, Visayan, Panay Island.—A short blade having a deep belly at forward or distal end, but narrowing toward the handle. Handle formed of hardwood and ornamented with carving of clan symbol in the form of a human face at pommel. Closed guard of iron. Length of weapon, 51.8 centimeters (20.4 inches); width of blade at greatest extension, 6 centimeters (2.4 inches). Collected by Maj. and Mrs. Edgar Russel. (Pl. 12, No. 9.) Cat. No. 288208, U.S.N.M.

Barong-bolo type, Cebu, Visayan Islands.—A steel blade chased on the outer side only from the shoulder to the obliquely truncated slope. The ornamentation consists of a continuous floral design etched along the posterior half of blade and overlaid with gold. Blade is heavy and thick at back, which is slightly concave; cutting or anterior edge is strongly convex and has spur point. The shoulder

projects anteriorly and forms a guard; it is etched and chased on both sides. Handle is ferruled at each end with bands of silver; it is composed of carabao horn richly engraved with floral pattern. The grip, contracting toward the neck, is fashioned to fit the hand; handle is slightly recurved downward or posteriorly.

Length of bolo, 45.5 centimeters (17.9 inches); length of blade, 30.5 centimeters (12 inches). Collected by Frank F. Hilder. (Pl. 12, No. 4.) Cat. No. 217029, U.S.N.M.

Bolo-barong, Bagobo, Mindanao.—This bolo has a blade resembling that of Cat. No. 305662, but is shorter. The blade widens evenly toward the central sector and again diminishes gradually toward the point. The cutting edge does not quite reach the shoulder at the handle end of the blade where it widens in section to the thickness of the back or posterior edge. There is an appreciable thickening of the median ridge throughout the length of the blade; the back develops into a cutting edge along the forward slope which is not abrupt, as both posterior and anterior edges are equally convex. The handle is formed of one piece of tanguile hardwood completely shod with figured brass. Pommel projects downward and has agee curve at its posterior edge. Grip is narrow and tapered to fit the hand. Ferrule and guard of one piece of cast brass.

Length of blade, 40.5 centimeters (15.9 inches); length over all, 55 centimeters (21.7 inches). Length of guard, 5.4 centimeters (2.1 inches). Collected by Gen. James M. Bell, United States Volunteers. (Pl. 12, No. 3.) Cat. No. 209364, U.S.N.M.

Barong and sheath, Samal Moro, Sulu Archipelago.—A cutting and slashing weapon. The blade is lanceolate leaf shape, 6.5 centimeters (2.5 inches) wide at center with slope evenly tapered along the posterior and anterior edges. The lateral surfaces of blade are flat and reach a width of 0.8 centimeter in section at back. Handle is of hardwood carved at pommel and ornamented with silver trimming. Handle is shod with a ferrule 7.5 centimenters (2.9 inches) in width, which is composed of several small silver bands linked together so as to form a low relief at each end and at center of ferrule. Covering the silver bands is a network of two-ply double-braided silver cord. The pommel projects both anteriorly and posteriorly and is fashioned into a pattern of intricately carved wood scrolls in the form of an ogee curve so arranged as to resemble the human face. The wooden sheath is similarly ornamented with scrolls and fretwork. Samal Moro.

Length of blade, 43 centimeters (16.9 inches); length over all, 59 centimeters (23.2 inches). Presented by the Samal Moro to President Theodore Roosevelt. (Pl. 11, No. 2.) Cat. No. 233590, U.S.N.M.

Barong, Moro, Mindanao.—A beautifully proportioned lanceolate leaf-shaped blade, having a convexity of posterior edge or back slightly less than that of the convexly curved cutting edge. Greatest width of blade is 7.6 centimeters (3 inches); sectional width of posterior edge at hilt is 0.8 centimeter. The blade tang is inserted into the carved dugong ivory handle, where it is firmly secured with a black gummy cement. The grip is overlaid with an hourglass-shaped ferrule consisting of multiple joined and overlapping bands of silver, each grooved and filleted. The motive of the ivory carving on pommel is an ogee curve repeated. The back lateral surface of pommel is plain. The sheath has flat surfaces of hardwood polished from use. It consists of two hollowed slabs glued together at lateral edges with black paste. A cord wrapping occurs at distal end. A flaring scroll carving projects from the lateral sides at the top of sheath; both this carving and a projected motive at the distal end of sheath have the characteristic ogee of recurved S pattern.

Length of blade, 37.6 centimeters (14.8 inches); length of weapon, 58.7 centimeters (23.1 inches). Collected by Dr. William Oyster. (Pl. 11, No. 1.) Cat. No.288361, U.S.N.M.

Basketry bolo case.—The basketry bolo case of the Yacan and of the Basilan Moro consists of the following structural parts: The bottom, which is worked from soft wood; the body, consisting of rigid splints of bamboo, circular in shape, but oblong and flattened or pinched together at the bottom; the border, consisting of two sections of Malay knot work and basketry weaving and rattan hoops; and the carrying parts, consisting of split half stems of rattan laid on the back of the body outside and held fast by a series of Malay knots.

Dr. Otis T. Mason, who first described this type of reticule or work bag,[6] gives the following description of the basketry technic there developed:

> The structural parts at once awaken interest through the economies displayed in uniting the greatest capacity and strength with the least weight of the vehicle.
>
> The bottom is divided into quite distinct portions, the outer and the inner. The former is the footing—keel-shaped, parallel-sided, and rudely carved in front. The inside portion, acting as a lining to the bottom, is in shape of a long, elliptical dish, to serve as a rest for the weapons and other belongings. The furrow between these parts receives the textile elements of the inner basket.
>
> The technic of the body is in uniform, rigid splits of bamboo. These are woven in four directions—horizontal, dextral, sinistral, and vertical. The splints are woven in two series—an inner, with a hexagonal weave in large open mesh work, and an outer series, the splints of which pass through the meshes of the inner series of splints, six elements through each mesh.

[6] Proc. U. S. Nat. Mus. vol. 33, pp. 193–196, 1908.

The dextral and the sinistral elements of the inner series pass through holes in the upper border of the softwood footing. The effect of the double weaving is to produce an almost compact technic, with the splints of the inner basket nearly concealed.

The ornamentation of the bolo case lies in the technic, in carving and staining, and in smoking or charring. The footing is stained black and is carved with simple geometric incisions. The weaving of the body is smoked so as to present an hourglass-shaped design in natural color, effected by laying splints of leaf on the surface of the case while the smoking goes on.

This type of utility carrying or weapon case is found in more or less modified form throughout the southern islands, especially in Mindanao. Several similar bolo cases from the Bagobo of Mindanao, also from the Batak of Palawan, and from Basilan Island are in the Museum collections. The case is worn suspended from the belt.

Height of case, 35.6 centimeters (13.7 inches); diameter at top, 13 centimeters (5 inches). Collected by Dr. E. A. Mearns, United States Army. Cat. No. 239086, U.S.N.M. (Pl. 8, No. 4.)

Basketry scabbard, southern islands.—The structural parts of this knife scabbard consist of a rattan framework and of rattan splints woven in basketry openwork weave between the two uprights and the bottom. The weave is in single series and is much simpler than in the type of basketry bolo case just described. The rattan frame consists of a single stem 1½ centimeters in diameter, segments of which have been cut away so that the stem has been flattened laterally. Holes are drilled through the stem at the center at intervals of 2 centimeters. The stem is now bent in the form of an elongated horseshoe with parallel sides and bottom straight and at right angles. To facilitate the turning of the corners at the bottom, triangular sections have been cut away. Splint elements are now passed transversely across from one upright to the other and drawn through the holes, after which they are passed down the sides of the uprights to the next crossing and so on down to the bottom. The interesting thing to note is that these transversely placed elements are in pairs, one resting on top of the other. This constitutes the warp or passive part of the body. The woof elements are likewise woven in pairs on the inner surface only, and here they are placed side by side. The opposite or outer flat-surface elements are separated, and the mesh is correspondingly smaller. Beginning at the top warp elements, over which the woof elements are passed, and passing spirally down the side surfaces at a diagonal, first touching the left upright and then the right, the splints are passed through the holes at the bottom, four splints passing through each hole, and are again woven in spiral diagonals up the opposite

surface until the upper transversely placed warp element is reached and over which they are woven. The process appears endless, as the ends of the splints are carefully disguised by being tucked under, no two splints terminating at the same place. The surfaces are free from any attempt at ornamentation.

The carrying attachment is an extemporaneously attached belt cord passing through the meshes of the surface woof elements one-third the distance from the top of the scabbard. The cord constitutes the belt piece and is provided with a toggle of burned and smoked leather at one end and a loop at the other end.

Length of scabbard, 41.5 centimeters (16.3 inches); width, 10.5 centimeters (4.1 inches). (Pl. 8, No. 1.) Collected by Capt. E. Y. Miller.

Basketry knife case, Bagobo, Mindanao.—The parts consist of two uprights of palmwood between which and over which are passed splints in irregular herringbone or twilled weave. Wherever the weave is regular and close, as occurs on the surface of the uprights and at regular intervals on the lateral surfaces, the elements have been coated with a black paste or cement. The intervals between, which appear in hexagonal openwork weave, are plain; the meshes here are partially filled in each with five splint elements passing diagonally between the two uprights. There is no bottom; this allows the point of the knife to protrude, or, again, the curved blade may be so short that the lateral surfaces of the sheath are longer than the blade, and thus no bottom is necessary.

Length of sheath, 28.5 centimeters (11.2 inches); width, 13.5 centimeters (5.3 inches). Collected by Alonzo H. Stewart. Cat. No. 230817, U.S.N.M.

Kampilan, Moro, Lake Lanao, northern Mindanao.—The long, straight and heavy single-edged blade is a favorite fighting weapon of the Moro of northern Mindanao. The straight surfaced blade has etched on its lateral surfaces a continuous arabesque floral design supplemented with punctated etchings filling in the intervening space. Guard and handle are fashioned from separate pieces of uncarved red lauan wood. The general outline of crescentic guard and bifid pommel resembles Cat. No. 324259, U.S.N.M.

Length of blade, 51.3 centimeters (20.2 inches); length of handle, 20.5 centimeters (7.9 inches). (Pl. 7, No. 4.) Cat. No. 257687, U.S.N.M. Collected by Chaplain Joseph Clemens, United States Army.

Hairy kampilan, Moro, Fort Bacolod, northern Mindanao.—A straight sword blade provided with single cutting edge and straight back; used in warfare. The blade is thin in section, without median ridge or groove, and is unornamented. The hairy kampilan, like all kampilans, the talibong, and certain forms of the parang and bolo,

tapers from a broad distal end to the narrowed section near the guard. Width at proximal or guard and of blade, 3.3 centimeters (1.3 inches); width of distal end, 5.6 centimeters (2.2 inches). Distal end of blade terminates in the characteristic pointed and sharpened excrescences, the recurved bill hook or prong and other projections of conventional design. The handle is fashioned from a dark-brown hardwood, while the huge crescentic guard ornamented with scroll carvings is fashioned from a lighter colored hardwood. A sword breaker consisting of a double loop of iron projects 1 centimeter from the side of the wooden guard. The handle is overwoven and wrapped with rings of rattan splints. The splints are passed through a hole drilled through the pommel at the junction of the bifid fork. A metallic button is fastened over the hole. Other ornamental work lies in the scrolled etchings, covering entire surface of pommel except at one edge, which is flattened and provided with holes for insertion of horse-hair tassels.

Length of blade, 74 centimeters (29.1 inches); length of handle, 28 centimeters (11 inches). (Pl. 7, No. 1.) Cat. No. 324259, U.S.N.M.

Among the kampilans from the southern islands are a number of blades that do not conform to the type as it is usually produced. The straight-blade edges may be present only in part, while the terminal recurved spike and chiseled ornamentation at the distal end are missing altogether. The usual type of kampilan variant seems to be a long barong blade type. The blade is elongated and the curved lateral edges are not as prominent as in the true barong, while the thick-sectioned back may even be straight edged, as in the true kampilan. The characteristic blade length, together with the long carved wooden cross guard, sword breaker, wrapped grip, and carved bifid wooden pommel, indicate that the weapon is closely related to the chopping blades of the kampilan type.

One of these barong-kampilan parangs was presented by James M. Sheridan, Cat. No. 329522, U.S.N.M. It was obtained from the Moro of the vicinity of Malabang, southern coast of Mindanao. The blade is 68 centimeters (26.7 inches) long; the back is thick and flat, and toward the distal end is sloped at an angle; the slope has a cutting edge equally effective in piercing and stabbing. The cutting edge is convexly curved from the point at the distal end to near the guard, where the blade has the least width, 2.7 centimeters (1 inch), the greatest width being 4 centimeters (1.6 inches) at the point of the beginning of the terminal slope near the distal end. In several blades of the kampilan-barong type in the Museum the maximum width is even greater and both the back and the anterior cutting edge are convex. A unique feature on many examples is the elaborate

sword breaker and guard extension of metal that projects from the wooden guard on the outside. Most of the similar devices consist of a scrolled iron rod fastened to the side of the wooden guard at each end; others consist of pieces of wire. The guard in the weapon just described has a wire looped through two holes drilled through the wooden guard at each end; to this wire is attached a section of chain armor 6 centimeters (2.4 inches) long. The guard chain overhangs the hand gripping the sword handle and affords protection to the fencer against glancing blows that have been deflected by the sword blade itself. The chain links are of closely joined copper of a mesh similar to that found on most of the coats of chain mail of early Spanish or of more recent Moro manufacture. The links are so closely joined as to appear to be welded, but the juncture points may easily be pried apart. Each link is joined to four others, which is the commonly employed system of the medieval armorer.

The kampilan is ordinarily considered a typical Moro weapon. In the form in which this sword occurs in the Moro country this is undoubtedly true. The term kampilan, however, is an old one and indications are that the weapon formerly had a much wider distribution. In one of the northern Luzon Ibaloi songs recorded by Otto Scheerer[7] the word kampilan occurs:

Have met I the headman shouldering the kampilan
Inaspol ko's kapitan Anakbat ne *kampilan*
Asked me where place of going mine
Imbagan to twai daguan ko
Said I shall go down I to Ilokos
Inkuan ko manalung ak chi Idoko
Shall cut off he, said, he, the head mine.
Kompolin to kono e toktok ko

The mixed Negrito population of the Province of Pangasinan, Luzon, near Mangataren, also carry a knife called the "kampilan." This knife has a wide curving crescentic blade. Negritos have been observed in a dance called "baluk," in which the knife is displayed. The two instances cited indicate that the kampilan is a weapon known to the Nabaloi of Benguet Province and to the Negritos of Pangasinan Province, northern Luzon. In neither case, however, is the weapon at all similar to that of the Moro.

Kris, Moro, Mindanao.—This steel blade is a rare and beautiful ceremonial weapon employed by the Moro priests. The blade in outline shows the characteristic wavy excrescences. There are three of these on each of the two cutting edges near the proximal or handle section. The terminal section has straight lateral edges. Both the inner and the outer lateral surfaces have four longitudinal grooved

[7] Ethnological Survey, vol. 2, pt. 2, p. 149.

flutings extending from the handle, paralleling the wavy configuration of blade edges and terminating by juncture 10 centimeters (4 inches) below; from point of juncture to a point 10 centimeters (4 inches) from the distal end there are two parallel shallow etched grooves following the wavy outline of the blade. A metal tang hafting is inserted in the hardwood handle and is fastened by a black gummy cement.

The guard is of characteristic Moro workmanship and is fashioned into an ogee or sigmoid curve on both lateral edges in such a manner as to represent a human head figurine. Two stirrups of iron hold the guard in position.

The hardwood handle is shod with five fillets of hammered and chased gold alternating with silver plaiting. Each filleted gold band is 1 centimeter wide and is ornamented with a floral design consisting of a four-petaled calyx and of two larger lanceolate leaf-shape outlines with incurved tips placed between.

The pommel is fashioned of dugong of sea cow ivory carved in characteristic ogee or sigmoid curve. The wood scabbard is carved and is banded with rattan splints.

Length of weapon, 59.5 centimeters (23.4 inches); blade length, 46.5 centimeters (18.3 inches); grip length, 8 centimeters (3.1 inches); width of blade, 13 centimeters (5.1 inches). Collected by D. W. Oyster. Cat. No. 288362 U.S.N.M.

Kris, Jolo.—This weapon, made of steel, has 11 wavy crests on each of the two lateral cutting edges. A metal tang extends the entire length of the hardwood grip, which is shod with five filleted bands of thin silver, each 1 centimeter wide. Between each of these encircling bands are coils of thin braided silver wire arranged in a complex cross braid. Embossed grooves encircle each of the five silver bands in such a manner as to hold the filleted bands securely in position and to prevent the silver wire from slipping. The pommel, projecting in S shape curve perpendicular to the grip, composed of solid silver, is bird shaped, and is fashioned with the characteristic ogee curve at each of the projecting ends. The guard is composed of two pieces welded on to the steel blade and secured by two stirrups. The stirrups are in turn fastened to the grip by loops of thin brass which are passed over the top of each stirrup and inserted in the hardwood of the grip under the silver filleted bands. A median ridge extends down the center of the ungrooved blade following in its course the waves of the lateral edges.

Length of blade, 57.5 centimeters (22.6 inches); length over all, 74 centimeters (29 inches). Collected by Frank F. Hilder. (Pl. 14, No. 7.) No. 216885, U.S.N.M.

Kris, Moro, Mindanao.—A blade with two waves near the proximal end has grooves similar to No. 288362, but the flutings are shal-

lower and shorter. Two parallel grooves extend one-half the length of blade; these grooved etchings divide the lateral surfaces longitudinally into three sectors, obviating the employment of a median ridge. The blade is a rare old weapon and was employed by the executioner and priest. The guard is a circular hardwood disk; stirrups are not employed. The hardwood handle is carved and has an extended pommel resembling the tail fin of a fish, a characteristic form.

Length of weapon, 66.1 centimeters (26 inches). Collected by Miss Isobel H. Lenman. (Pl. 1.) Cat. No. 303794, U.S.N.M.

Kris, Moro, Mindanao.—This steel blade has five waves on each of the two cutting edges; a median ridge follows each wave throughout its course. There is a guard piece made of two ornamental pieces of steel projecting posteriorly and anteriorly in characteristic Moro pattern. This is characteristic of the guard forms of most of the older weapons which do not show influence of European acculturation. The guard piece is secured by means of a stirrup which is itself fastened, as are the stirrups in No. 216885, by looped spikes inserted between wooden grip and its cord wrapping, which extends from guard to pommel. The pommel is of sea-cow ivory carved in sigmoid curve. The scabbard is of wood and is well made. The two hollowed slabs of which it is composed are glued together with a cement similar to the black paste that covers the cord wrapping on the hilt. The scabbard does not cover the guard, and stops short of it. One narrow band of carabao horn encircles the scabbard near its base.

Length of blade, 58.5 centimeters (23 inches); length of weapon, 72.8 centimeters (28.6 inches). Collected by Mrs. Caroline E. Bates. (Pl. 14, No. 5.) Cat. No. 290482 U.S.N.M.

Kris, Moro, Mindanao.—The steel blade has two wave crests near the proximal end, but remainder of blade is straight. Four short grooves merge into one another 11 centimeters (4.4 inches) from the guard. Two parallel grooves extend nearly to the point and divide the blade transversely into three equal sectors. There is but one guard stirrup, which is placed anteriorly, the posterior guard section, although of much longer projection, has no stirrup. In this specimen, as in many other Moro krisses, the section of guard projecting downward or anteriorly is much thicker in section, also shorter, than the posterior section; it has also much more highly ornamental chiseled openwork, mostly in form of scrolls and curves resembling the ogee S shape, often so arranged as to resemble the human face. The hardwood grip is wrapped with bands of rattan braid woven in a complex cross plait.

Length of blade, 56.5 centimeters (22.2 inches). Collected by J. M. Harkins. (Pl. 14, No. 1.) Cat. No. 213665, U.S.N.M.

Kris, Moro, Mindanao.—This steel blade is one of the oldest in the Museum. Lateral edges are almost straight, although the blade is somewhat curved in outline. Tip of point is nearly oval and the blade is oval in section throughout. The guard consists of a short anterior projection and of a much longer and thinner posterior segment. The guard is provided with ornamental scrolled etchings along the anterior section. A single brass stirrup secures the anterior ornamental section of the guard and fastens it more securely to the blade, to which it is joined by welding. The blade is joined to the hardwood handle by a metal tang which is inserted into the grip section. Grip is ferruled with a band of polished brass and is wrapped with waxed cord. The pommel is shaped from polished hardwood and constitutes an extension of the grip section. It is fashioned in the form of an ogee or sigmoid curve.

Length of weapon, 65 centimeters (25.6 inches); length of blade, 51 centimeters (20 inches). Collected by the United States exploring expedition under Admiral Wilkes, 1838–1842. Cat. No. 3994, U.S.N.M.

Kris, Moro, eastern Mindanao.—The steel blade has six wavy crests on the anterior and posterior lateral edges; the point and distal end sections are slightly curved toward the anterior cutting edge. One stirrup suffices to fix the guard firmly in position; it extends from the chiseled ornamentation on the anterior cutting edge of the blade just below the guard to the top of the ornamental guard piece, where it terminates in a spike which extends upward the entire length of the handle, where it is fixed by a rivet inserted first through the spike and then through the pommel, which is a slightly bulbous extension of the grip. Like all krisses without exception, the handle curves downward and anteriorly. The grip which is fitted to the hand is wrapped in simple roll with waxed cord which passes also over the stirrup spike, lending additional firmness. The posterior extension of the guard is much longer than the anterior section, but is firmly welded to the blade and no stirrup is necessary. Like the anterior section, it is carved with chiseled ornamentations in the from of an ogee S-shape curve at its lateral edge. This ornamentation may serve as a sword breaker; it is highly conventionalized in design and occurs in most of the guard ornamentations on Malay krisses.

Length of blade, 60 centimeters (23.6 inches); width of blade, 4.5 centimeters (1.8 inches); sectional width at median ridge, 0.6 centimeters. Collected by Max List. Cat. No. 326599, U.S.N.M.

Inlaid serpentine kris.—The blade is of recent manufacture, as indicated by the welded guard and the stirrup. Throughout the central sector of the blade and following the line of the median ridge is an inlay of a soft silver metal patterned in arabesque floral

design; the hard steel has been chiseled away and the softer metal has been pounded into the etched incisions similar to the copper inlay on No. 313911, U.S.N.M.; toward the proximal end the inlay becomes an embossed fluting in low relief. Ornamental designs occur on both the inner and outer sides. The stirrup piece is purely ornamental and no longer serves a useful purpose, as the guard piece has been forged and welded to the blade. The handle is nondescript and has probably been added to the ensemble by another craftsman. This weapon and a similar blade, Cat. No. 248899, U.S.N.M. are the longest blades of the kris type in the Museum collection.

Length of weapon, 76.4 centimeters (30 inches); length of blade, 67 centimeters (26.4 inches). Collected by Dr. Robert B. Grubbs, United States Army (Pl. 14, No. 2.) Cat. No. 3488, U.S.N.M.

Serpentine kris, Moro, Mindanao.—The unusual features about this blade lie in the departure from the usual Moro type of weapon. Influence of foreign design is noticeable in ornamental design on handle, in the double curve on the guard, together with its overhanging flange. The guard is of silver, the edges of which are milled like the edges of a silver coin. A drop flange has engraved on it the initials of the owner or maker. The blade is also unique in that it tapers from the grip to an acute daggerlike point. The carabao horn handle is beautifully carved and embossed to represent an intricate floral pattern; the hilt is ferruled with plain silver bands.

Length of weapon, 80.6 centimeters (31 inches). (Pl. 14, No. 4.) Cat. No. 313911, U.S.N.M.

Chinese and Japanese blade types.—Throughout the existence of the feudal age in Japan there was continuous fighting between various families and clans, not to mention the wars against the Aino. The profession of the warrior was held in high esteem and "the sword is the soul of the Samurai" was a quotation often employed. Still, from the first, the Japanese seem to have been an artistic people and much store was set on the decorative design on weapons of all types. An old writer, quoted by John Ogilby in 1670, writes that "they also have javelins tipt with gold or silver and their Pikes, which are longer but lighter than ours, they know how to handle dexterously. They also set a strange rate upon sword-hilts, especially when made by some peculiar masters." It can readily be seen from a statement such as this that the later development of the Japanese swords and other weapons was along entirely different lines from that of the Malaysian, and more particularly the Filipino types. The earliest swords of the Japanese were made of copper or bronze. Primitive swords recovered from dolmens and now exhibited in the Imperial Museum of Tokio and

the Metropolitan Museum of Art in New York have straight iron blades sharpened to a single edge. This is the tsurgi, the most ancient form of Japanese sword; it either antedates the Chinese two-edged blade or represents a development away from Chinese influence, though the latter may be detected in the dragon designs generally carved on the pommels. Engravings ornamenting the blades sometimes represent dragons, Chinese characters, words, or even whole sentences, and sometimes Sanskrit letters are added as a sacred charm. The conventionalizing of blade form, the gaudy nature of the artistic ornamentation, and the practical uselessness of the Chinese swords have proceeded much further than is the case with those of the Japanese. This is especially noticeable in the Chinese double sword.

Double sword, Chinese.—Two steel blades are fitted to a single shark skin scabbard. Each blade is complete and is identical on inner and outer lateral sides. Each has a double cutting edge and is tapered in section from a median ridge at center of outer side of blade. Edges are straight, tapering gradually from guard to sloped and pointed distal end. The guard, handle, and pommel of each of the two blades are complementary to the other and are placed in the round on outer side of blade; the inner lateral surface of the handle is flattened, so that when the two swords are placed side by side they form a unit. Blades are unornamented; guard, ferrule, and pommel are of case white brass decorated with a dragon design and Chinese characters. The grip is fitted to the hand and is formed of carabao horn. Beaded and fringed silk tassels in pink and green colors are attached to button on pommel. Shark skin scabbard ferruled with cast brass bands. Chinese manufacture.

Length of blade, 45 centimeters (17.7 inches); over all, 62 centimeters (24.4 inches). Collected in the Philippines by Capt. G. P. Ahern, United States Army. Cat. No. 248893, U.S.N.M.

Dagger, Mandayan, Agusan River Valley, Mindanao.—The blade of this dagger "balarao" has an elongated diamond shape and is worn inverted at the belt. It is entirely unlike the Moro kris-dagger "punal-de-kris" and seems to be a local development of the Mandayan, a mountain tribe of eastern Mindanao. The tang passes entirely through the wooden hilt, which is encircled with a band of sheet silver 1 centimeter wide and extends an equal distance beyond. Two wooden horns project similarly from the base of the hilt at the posterior and anterior edges; the three prongs are thus fitted to be grasped between the second and third fingers. The inverted scabbard hangs concealed point upward at the belt and the blade is held in place by a thread. The weapon may readily be grasped in the everted hand, torn from the scabbard, and passed upward under the victim's ribs at one stroke. The scabbard is composed of two

hollowed slabs of wood, one of which is fitted with a transverse perforation near the distal end for attachment of suspension cord. The scabbard is wrapped with cord in double crossed roll which is covered with pitched cloth.

Length of blade, 17.5 centimeters (9.9. inches); length over all, sheath included, 32.6 centimeters (12.8 inches). Collected by Richard Coleman. (Pl. 13, No. 2.) Cat. No. 205551, U.S.N.M.

Dagger, eastern Mindanao.—The blade of this dagger "balarao" is more lanceolate leaf-shaped and shorter in proportion to breadth of blade than is No. 205551, U.S.N.M. The scabbard also varies from No. 205551, U.S.N.M. in that it is incurved, an arrangement secured by cutting off one of the two component slabs, enlarging the other, and carving it to dovetail with the truncated slab.

Length over all, 29.5 cubic centimeters (11.6 inches); length of blade, 15.4 cubic centimenters (6 inches). Collected by Dr. Robert B. Grubbs. Cat. No. 3515, U.S.N.M.

Malay dagger.—The blade is of well-tempered steel. It tapers from the guard piece downward to the acute pointed distal end and is slightly curved, but is not of the wavy kris type. The anterior cutting edge is concave while the posterior is convex. The blade has flattened and unornamented lateral sides except for the slope near the edges and is 0.6 cubic centimeters in section. The guard piece is distinct from the blade and is slotted to fit over the tang end. The pistol-shape handle is curved downward or anteriorly like the handle of a kris. The ferrule is of punched silver, having a coppery glint; it is studded with a fretwork of embossed floral design. The polished hardwood grip and pommel are carved with representation of an animal figure, probably mythical, and resembling a seal or probably a snake. This conventionalized figure occurs on handle carving of many daggers produced in Malaysia.

Length of blade, 25 cubic centimeters (9 inches); length of blade and scabbard, 39.7 cubic centimeters (15.6 inchs).

The old form of scabbard is composed of three pieces of hollowed wood or bamboo, the proximal end piece, the long central section, and the cap piece at the distal end. In specimen (cat. No. 3897, U.S.N.M.) the two end pieces are formed of highly polished but unornamented light tanguile wood, while the central sector, which is 20.5 cubic centimeters (8.1 inches) long, is formed from a darker colored piece of wood. The scabbard is characteristically Malay in that it consists of three distinct pieces and in the curved flare of the outwardly projecting flanges of the proximal end or guard piece, which reaches a total length of 16.5 cubic centimeters (6.5 inches).

Collected by Captain Lewis, of the bark *Java* and presented to the Wilkes Expedition, 1838. (Pl. 13. No. 6.) (Cat. No. 3897, U.S.N.M.

Malay laminated dagger.—The blade is typically kris shaped, having four wavy crests on either of the two cutting edges. The composition of the iron metal of the blade is low grade, containing much carbon; the blade is soft and has a poor temper. The median ridge is marked, but the places of juncture of the hammered iron rods of which the blade is formed are plainly visible. The blade is narrow and tapered. The proximal end has an ornamental headpiece chiseled at its posterior edge resembling a human head. The guard piece is distinct from the blade and is fitted over the iron tang which is hafted into the ivory handle. The carving, which covers the entire surface of the ivory handle, is beautiful; coloring ranges from a clear white to a delicate shade of amber. The carving as a whole is in the Javanese style and represents some animal or reptilian figure such as occurs on many of the older Malay dagger handles similar to No. 326067, U.S.N.M., No. 255889, U.S.N.M., and No. 3897, U.S.N.M. The scabbard is composed of three pieces and resembles that of No. 3897, U.S.N.M.

Length of blade, 31.5 centimeters (12.4 inches). Collected by the Admiral Wilkes exploring expedition. (Pl. 13, No. 5.) Cat. No. 3896, U.S.N.M.

Malay dagger, Dyak, southeast Borneo.—This blade is not from the Philippines, but was collected from the region of the Pasir River, southeast Borneo. The resemblance to the flame-shaped daggers of the Moro and of the Javanese is striking. Similarity of design is also apparent in the curved hardwood handle with its animal figure carving, in the form of scabbard, in the distinct guard piece, in the chiseled ornamentation of the anterior edge of the blade at enlarged sector just below the guard, and in the juncture lines of the component iron rods of which the blade is composed. The juncture lines have been laminated into a beautiful decorative design by steeping the blade in lime juice which corroded the edges, forming a fantastic outline in striated parallel lines, in concentric circles of irregular outline, and many other shapes.

Length of blade, 38.5 centimeters (15.2 inches). Collected by Dr. W. L. Abbott. (Pl. 13, No. 8.)

Dagger.—The blade of this serpentine dagger is characteristically Moro, and has three wave crests reaching from the proximal end to the middle of blade. The point is straight. The blade is of well-tempered steel. Spanish influence may be noted in the silver guard, each end of which terminates in an ornamental cross. The ferrule has been incorporated at its center, through which passes the tang

which extends entirely through the handle. The grip is straight and is of spirally fluted ebony. A small silver ferrule with button attached caps the proximal end. Scabbard is composed of imported leather and has a silver cap reinforcement at its distal end and a ferrule of similar material at the base.

Length of blade, 27.5 centimeters (10.8 inches). Collected by Gen. Jacob Kline, United States Army. (Pl. 13, No. 12.) Cat. No. 313926, U.S.N.M.

Dagger.—"Goo' na" (Moro). A serpentine blade of fine steel. The handle is formed of wood and is shaped similar to the butt of a pistol, with the downward curve projecting anteriorly at right angles to the blade. The ferrule and guard are composed of cast white brass. Sheath is formed of wood and is hooped with brass. This dagger composed part of the equipment of Datto Macabata, killed in battle at Lake Lanao August, 1903.

Collected by Dr. Edgar A. Mearns, United States Army. Cat. No. 229441, U.S.N.M.

Dagger, Moro, Mindanao.—The blade has two wavy crests along its basal or posterior section. The distal end has straight edges but is slightly curved anteriorly. The blade and horn handle have the characteristic type form. Handle is carved from carabao horn and is beautifully polished; it is oval in section and is tapered at the middle to fit the hand; pommel end is curved anteriorly and is tapered after the pattern of most Moro dagger handles. Guard is ovoid in shape, truncated at the ends, and is composed of a thin silver disk. A banded ferrule of etched carvings consisting of encircling grooves, rickrack, and star and crescent figures encircles the horn handle at its base. The hardwood sheath consists of two hollowed slabs elliptically ovoid in section, straight in outline, slightly tapered and plain. They are held together with three-ply braided bands of rattan. (*Daemonorops gaudichaudii.*)

Length of blade, 23.4 centimeters (9.2 inches); width of blade, 3.3 centimeters (1.3 inches); length of handle and blade, 33.3 centimeters (13.1 inches). Collected by Miss Isobel H. Lenman. (Pl. 13, No. 7.) Cat. No. 303795, U.S.N.M.

"*Insurrecto*" *dagger.*—The blade is of an excellent grade of steel, double-edged, and beveled to a very pronounced median ridge. The ferrule and guard are of one piece of German silver. Guard ends project in the form of an elongated ellipse with a rounded ball of metal 1 centimeter in diameter at each end. The handle grip and pommel are formed of carabao horn, bulging at the center, and punched with small German silver ornamental rivets arranged in diamond-shape design along one side of grip. An arabesque floral ornamental design encircles the constriction of grip just below the pommel. The pommel is formed of the same piece of horn as the

grip and is carved to represent a hand emerging from the handle grip which is filleted at the base with a design representing the sleeve of a garment. In the hand carving is held a heart-shaped object. At the tip of pommel is a button or cap of silver, threaded onto the end of the tang which extends entirely through the handle. At the central inner section of the blade and extending along the median ridge is an etched ornamental batik arabesque design, while on the outer surface is the Katipunan emblem representing the rising sun etched within a triangular shield together with two superimposed flags and the inscription "Veneer-morir." The scabbard is made of silver and has on its inner surface a similar Katipunan design. The weapon is modern and is introduced here to illustrate the influence of Spanish metallurgy and ornamental design.

Length of dagger blade, 34.5 centimeters (13.6 inches); length of handle, 14.3 centimeters (5.6 inches). Collected by Mrs. H. C. Corbin. (Pl. 13, No. 13.) Cat. No. 258300, U.S.N.M.

Punal de kris, Moro, Mindanao.—The blade is concavo-convex or dirk shaped, chased on both inner and outer sides on the sections near the handle extending from the broad back one-half the distance toward the sharpened cutting anterior edge. The posterior lateral edge becomes thinner, but is not sharpened along distal section of blade; the handle is formed of wood and is plain; a heavy ferrule of cast brass is banded about the neck end of handle and expands into the diamond-shaped brass guard.

Length of weapon, 23 centimeters (9 inches); length of blade, 14.5 centimeters (5.7 inches). Collected by Dr. Robert B. Grubbs, United States Army. (Pl. 13, No. 9.) Cat. No. 3499, U.S.N.M.

Woman's knife, Bagobo, Mindanao.—This steel blade has a circular cutting edge convexly rounded so as to inscribe one-half of an ellipse. The back of the blade is thick and straight except for the sector at the proximal end, which has been cut away in the form of an irregular hollow curve. The metal tang is hafted in a brass-shod handle convexly curved posteriorly and concave on the under or anterior cutting edge. The base is truncated in a double-ogee curve, giving the effect of a snake-head carving similar to the carved pommel on the Moro daggers of wood, ivory, and metal. A hole pierced through the brass at the beak or lower anterior corner of the handle represents an eye and increases the realism of the figurine design. This punched or incised hole appears in identical position on the Moro figurine dagger handles formed from other materials. A peculiarity in the operation of the knife is that the blow or steady pressure must always be exerted upward and not downward, as in the heavier Malay knives or bolos. The sheath is composed of an inner core of wood, covered with a basketry case of woven rattan. This is in turn covered with a cotton cloth and a black cement paste.

Length of blade, 15.5 centimeters (6.1 inches); length of blade and handle, 26.2 centimeters (10.3 inches). Collected by Arthur R. Fergusson. (Pl. 13, No. 3.) Cat. No. 324350, U.S.N.M.

Knife, Bagobo, Davao Province, Mindanao.—This knife, known as a woman's knife, is similar to the knife just described; the handle is composed of solid brass with an ornamental design etched on the grip. This design consists of rickrack patterns encircling the grip transversely and by embossed flutings at intervals of 0.5 centimeter. The pommel is of punched brass from which an ornamental cover plate has been lost.

Length of blade, 15.5 centimeters (6.1 inches). Collected by Arthur R. Fergusson. Cat. No. 324349, U.S.N.M.

Knife, Bagobo, Mindanao.—The blade resembles the two Bagobo knives just described. There is a series of ornamental embossed flutings in the proximal sector adjoining the ferrule. The cutting edge terminates 2 centimeters from the proximal end. The handle is composed of red lauan, a dipterocarp hardwood. There is an iron ferrule at the neck but none at the basal end of the handle. The sheath consists of a rattan inner section woven in a combination of coiled and twilled weaves. Covering this basketry core is a cotton cloth waxed with black cement paste of which black beeswax is a chief ingredient. As the sheath is carried at the left side of the waist, there is no ornamentation of the sheath on the inner side. The outer side is covered with beadwork woven in close mesh in typical Bagobo patterns geometric in their nature. White, yellow, red, and black beads are employed. A belt for suspending the sheath to the waist is built up on a foundation of red cotton cloth, followed with a braided weave of abaca fiber, colored red, purple, and the natural straw color; above these two layers is a network of beads in close weave arranged in longitudinal lines at the edges of the belt and in circles at the center. The colors employed are white, red, yellow, black, and striated. A border of looped copper wire extends from base of sheath to the tip at both sides.

Length of blade, 15.5 centimeters (6.1 inches); length of blade and sheath, 27 centimeters (10.6 inches). Collected by Misses E. H. and S. S. Metcalf. Cat. No. 286204, U.S.N.M.

Knife.—The blade of this weapon is similar in outline to the weapons or knives just described. The handle is of a dipterocarp hardwood ornamentally carved. The sheath is of rattan splints cross woven between two upright braces. Bagobo, Davao, Mindanao.

Length of blade, 25.5 centimeters (10 inches). Collected by Alonzo H. Stewart. Cat. No. 230817, U.S.N.M.

Knife, Tagalog, Luzon.—This steel blade could also be considered a sword, as the weapon has been employed in warfare and conforms to the generalized barong-bolo type of sword or parang. The blade

is curved, slightly concave at the back, and has a corresponding convexity of cutting edge. The inner lateral surface is smooth and flat, while the outer surface slopes from a well-defined median ridge to the cutting edge, also to the back. The blade tapers gradually from center to point, which is acute. Handle is formed of lauan wood shaped octagonally and ferruled with iron bands. Stamped-leather scabbard, fashioned in Spanish style.

Length of blade, 42.5 centimeters (16.7 inches); length of blade, handle, and scabbard, 55 centimeters (21.6 inches). Collected by Mrs. James F. Courts. (Pl. 12, No. 1.) Cat. No. 292426, U.S.N.M.

Knife, Samar Island.—This blade is similar to the one just described. As it is flattened on the outer side and not on the inner, as is Cat. No. 292426, U.S.N.M., it is probable that it was made for a left-handed man. The weapon was captured by F. H. Driver while connected with Company I, Eleventh United States Infantry, at Quinapundar, Samar Islands. The handle is composed of hardwood deeply grooved transversely in the form of scrolls and is ferruled with brass. Cat. No. 329461, U.S.N.M. (Pl. 13, No. 1.)

Knife, Moro, Jolo Island.—The blade is long, flat, and narrow. In shape it conforms to the type just described, having a low curved belly, concave at the back, and provided with convex cutting edge. An ornamental design etched on both lateral sides covers the surface of the proximal end sector near the back. This consists of copper inlay on a pattern of parallel incised lines arranged rickrack fashion. Handle and sheath are of molave hardwood, carved on both sides in rickrack pattern; a similar wood carving appears on the outer side of the sheath. The two sections of which the sheath is built up are banded with four iron cuffs. The guard disk is S shape and is of plain copper. (Pl. 13, No. 11.)

HEAD HUNTING AND ASSOCIATED CEREMONIAL WEAPONS

Institution of head hunting.—One of the most impelling motives of intertribal warfare among the savage pagan and also among the Moro tribes is the prestige that attaches to those who have been successful in battle. The strongest and bravest of the tribe are entitled to enjoy a special title, "mangani," and to wear a special costume. Among the Bagobos, for example, a man who has killed two people is permitted to wear a chocolate-colored headband; if the number of his victims is four, he may don trousers of a blood red hue; when the number of killings amounts to six, he is able to completely apparel himself in maroon clothing. The incentive to make raids on neighboring tribes and villages is enhanced by the desire of every able-bodied Bagobo man to become a "mangani"; the desire to collect loot and slaves supplies an auxiliary motive when no other exists.

Mrs. M. C. Cole writes that "all Bagobo warriors are under the special protection of two spirits, Mandarangan and his wife, Darago, who dwell in the fissures of Mount Apo. They bring success in battle and give to the victors loot and slaves, but in return for these favors they demand at certain times the sacrifice of a human being. The Government is trying to persuade these spirits to accept a pig in place of a human life. Near the coast they are willing to do so, but they are more particular in the less accessible places. Datu Tongkaling claims to have killed more than 30 of his enemies in fair fight and to have assisted in an even greater number of human sacrifices."

As with most primitive peoples, attacks are made only when some advantage will accrue to the attacker. Ambushes of various sorts are devised. At such times no distinction is made between the able-bodied fighting members of the tribe and the children or the old people. A head is a head, regardless. Head-hunting was formerly as widely distributed as the Malayan ethnic stock, from the Nages of Assam across the Sunda Islands to the Moluccas and the Philippines. Certain symbols in the clothing of the Nagas indicate the number of captured heads; on the Mentawi Islands bodily tattoo marks increase with the accumulation of human heads. In certain areas in Luzon when a new family dwelling is to be constructed human sacrifices are in order, enemy heads are selected and buried under the foundation posts. This custom was formerly practiced by the Batak, but more recently pieces of red cloth came to be substituted for the bloody heads. Among some tribes the captured heads are artificially prepared and are hung up in the young men's dormitories.

Elsewhere in the Philippine Islands tribal units were always small and feuds were petty and continuous. Here, again, the rugged character of the terrain, especially in northern Luzon and in Palawan and in Mindoro, sufficed to keep the small political or tribal units from uniting. Often the local feuds and combats degenerated into a purely family undertaking. Among the Ifugao of northern central Luzon, who dwell south and east of the Bontok Igorot and northeast of the Benguet Igorot, not even the authority of headmen was recognized. The population, however, is here especially dense, totaling over 100,000, and the density to the square mile is that of an industrial rather than an agricultural district. Although the system of law worked out by the Ifugao is remarkable, the lack of competent authority leads to perpetual feuds. The individual or family suffering the affront must seek its own revenge. If their retaliation should take the form of an excess number of deaths meted out to their adversary, their act may lead to addi-

tional encroachment on their lives and property, which calls for additional retribution, and so the feud goes merrily on.

Where customs differ from community to community, as among the Kalinga, who dwell north of the Bontok and east of the Tinggian, the general name given to the many small groups, namely, "kalinga," enemy, seems quite appropriate. This loosely knit population of more than 50,000 equals the Ifugao in industry and in agricultural undertakings requiring united effort and the cooperation possible only under a system of law. But as late as the present century, after decades of American intervention, traces of their local feuds continue and private justice is the individual's last resort.

Throughout the Philippine Islands, and western Malaysia as well, the rule of private justice held sway. Head-hunting as an institution was its chief manifestation. Although but one phase of a ceremonialism that demanded the decapitated head of an enemy or stranger for different occasions, the real source of the practice lay in the private enforcement of law. The victim may be any individual belonging to a tribal group other than the one to which the party seeking vengeance or a head trophy belongs. Among some pagan tribal groups in the Philippines, according to Dr. J. R. Harris, agricultural undertakings such as rice planting could not successfully be undertaken without a preliminary head-hunting expedition. Ceremonies of many sorts call for a similar provision of recently decapitated enemy heads. Similar to the counting-coup of the Plains Indian, the primitive Filipino warrior enjoys increased esteem with each enemy head to his credit. After proudly displaying his bloody trophy the head was hung permanently on the door posts or on poles outside the house; sometimes the head was placed inside the house. This was a religious observation and provided safety to the dweller from the "anitos" or evil spirits. The Bontok Igorot buried the head and sometimes employed the mandible of the skull as a gong handle.

Substitution of human sacrifice and blood money.—The penetration of the higher Indian and Arabic religions throughout the southern islands caused the practice of head-hunting to fall into disrepute. Human sacrifice was substituted in its stead, and the evidence of a warrior's victories no longer was required to be placed on display. Marks on the side arms often indicated the number of victims the warrior had slain. At the time of the arrival of the Spanish, head-hunting was practiced much more extensively than at the time of the coming of the Americans. The Sambal, Ilocano, and the Cagayanes, all coast tribes of northern Luzon have become Christianized and have given up the custom. The Tinggian and the Benguet-Igorot discontinued the practice at a late date. The American Philippine Constabulary found it necessary to force discontinuance of the

practice by the Ifugao, Bontok, Kalinga, and other pagan tribes of the mountainous interior of northern central Luzon. To bring this about, drastic action on the part of the constabulary was often necessary. This does not imply, however, that head-hunting is completely stamped out. The force of peaceful example by those who have discontinued the practice is probably quite as effective as is armed force.

Two great civilized peoples, the Tagalog of central Luzon and the Visayas of Cebu, Leyte, Negros, Panay, etc., had discontinued taking heads of their own accord at the time of the arrival of the Spanish. The same applied to the Mohammedan tribes, likewise the Mindanao pagan Bagobo, Manobo, Mandayan tribes; also to the Negritos of western Luzon. Among some the cutting off of the ears of their fallen foes sufficed. Sometimes the hair was clipped to provide tassel ornaments for belts and scabbards. Count was kept of the number of enemies killed. The courage of the warrior and the skill with which he wielded his weapons always aroused the respect and esteem of the individual in the group. It is true that every man intended to pay his debts, including such debts of honor as avenging a violent death suffered by one of his family or group. If he paid the "debt of life" with interest and exceeded the balance, additional reprisals were called for and the feud did not stop.

It is at this point that mercenary interests enter, and wherever a headman's authority is recognized "blood money" is acceptable. At first money was proffered and accepted only where no intent to commit injury was present. As such the wrong was compoundable. When the institution of "blood money" gained entry within a group feuds became subject to money settlement. As the chief received a portion of the sum for his share, his influence was all toward the suppression of blood feuds. The fact that he was able to suppress such difficulties between neighboring tribal groups increased his influence.

The pagan tribes of the southern islands had developed the practice of human sacrifice, while the northern primitive tribes continued to take blood vengeance through head-hunting. The Visayan islanders leaned toward the former practice, while Mohammedan influence tended to discontinue both practices among its devotees.

The pagan tribes of the Mountain Province of northern Luzon formerly made of head-hunting a rite. This ceremonial religious observance has to a great extent been suppressed by the Philippine Constabulary. Tribal warfare has likewise become a thing of the past. Trophies of battle consisting of the skulls of the slain enemies formerly ornamented the walls of the house of the warrior. The severed heads of slain enemies were stuck by returning expeditions

on a pole which had attached just beneath as a further ornament the horns of a water buffalo, sacred leaves, and other ceremonial objects. The heads were now supposed to lend their aid to the successful tribe and were treated with respect. A sacrificial feast followed upon the return of a head-hunting expedition, the dog or common carabao being the sacrificial offering. The mandible of the decapitated victim was often employed as a handle end piece for the brass musical gongs.

Since the practical suppression of head-hunting, which includes also a ban on the production of spears and other weapons employed by the head-hunter, heads of sacrificial animals, or the horns of such animals replace the wall trophies before alluded to.

CATALOGUE OF TYPE WEAPONS

Head ax, Tinggian, Luzon.—The iron blade has tang extension set in a wooden handle which is shod with a long iron ferrule. Handle grip of yellow hardwood has carved spur on side at center for hand stop. The bowed back of blade is provided with spur extension. The crescentic cutting edge is expanded at back into a cutting spur of similar dimensions. A carrying basket, Cat. No. 248005, U.S.N.M., completes the Tinggian head-hunter's equipment.

Length of blade with handle, 42.7 centimeters (16.8 inches); blade length, 30.5 centimeters (12 inches). Collected by Dr. E. A. Mearns. (Pl. 1.) Cat. No. 248006, U.S.N.M.

Head basket, Tinggian, Luzon.—Structural parts are the basket proper, carrying parts, and basket cover. The basket parts are bottom, body, and cape. Weaving of the bottom and of the body is the same, close, oblique, over two twilled. A space 23 centimeters (9 inches) square is marked off for the bottom and bounded by four rods, neatly wrapped, outside of which is a thin square hoop or foot about an inch wide. The hoop and the sticks are finely sewed together with a rattan splint tied with a single and not with a Malay knot. The upper border has two lips neatly finished off with sewing or wrapping, half an inch wide, with false braid on the outer edge. Shoulder straps of braided rattan, set on as in knapsack, serve for carrying on the back. The unique feature is the attached cape of rain-coat flap which serves as a head covering and which is made of the outer hairy fiber of the palm. The fibers are taken in small bunches, doubled in the middle, and looped over rattan splints, which are strung on a bit of separate weaving.

Dimensions: 48.4 centimeters (19 inches) high; 45.8 centimeters (18 inches) wide. Collected by Dr. E. A. Mearns. Cat. No. 248005, U.S.N.M.

Head ax, Kalinga, northern central Luzon.—A steel blade hafted to brown hardwood handle with long metal tang. The blade has

crescentic cutting edge lengthening toward anterior into a spur with sharp point and cutting edge. A similar compensating recurved spur projects from the bowed back of blade and in line with it. This spur does not have a cutting edge, and is found in varied forms on all of the head axes of the northern Luzon pagan tribes. The wood handle is shod with ornamental overlay on crude silver and brass répoussé. An iron unornamented ferrule, 21 centimeters (8.3 inches) in length, encases the hafting end of handle; a similar shaped iron ferrule 8 centimeters (3.1 inches) long covers the proximal end. These iron collars are hourglass shaped, having longitudinally concave surfaces. The ornamentation on the proximal ferrule consists of series of encircling grooved bands; the spaces between the grooves are filled in with small, alternately circular and diamond-shaped etchings. The surface of the wood between the iron end pieces is filleted with 20 inset encircling bands of silver and brass; each band has an average width of 0.5 centimeters and is separated from the next filleted band by an equal distance. Alternating with this series is another series of encircling bands of brass répoussé, each band 4 centimeters wide, and covered with geometric, rectangular figures and small circular répoussé disks. A strip covered with similar répoussé work extends longitudinally the entire length of the handle from one end ferrule to the other and serves to hold the silver and brass filleted bands firmly in position by means of brass rivets.

Length of blade, 40.2 centimeters (13.8 inches); breadth of blade, 7.3 centimeters (2.9 inches); blade width in section at back, 0.3 centimeter; length of handle and blade, 57 centimeters (22.4 inches). Collected by Miss Isobel H. Lenman. (Pl. 10, No. 1.) Cat. No. 303791, U.S.N.M.

Head ax, Kalinga, northern central Luzon.—Steel blade formed in same shape as Cat. No. 303791; handle of plain hardwood polished by use. At center of handle is hourglass depression fitted to the hand, especially for the encircling forefinger and side of thumb. Immediately behind is a laterally projecting spur of the wood handle, wedge shaped toward the rear fitted to the ball of the hand but flattened in front. This is characteristic of the workmanship of the northern Luzon tribes in the manufacture of their head axes and seems to be found nowhere else.

Length of blade from end of spur to tip of blade, 34.4 centimeters (13.5 inches); blade section at back, 0.3 centimeter; width of blade, 7.7 centimeters (3 inches); length of handle and blade, 56.8 centimeters (22.4 inches). Collected by Miss Isobel H. Lenman. (Pl. 10, No. 2.) Cat. No. 303792, U.S.N.M.

Head ax, Igorot.—The iron blade has a broad concave cutting edge together with an extended edged spur. This corresponds in align-

ment and shape with a similar spur projecting from the back at the base of the ax head, which, however, has no cutting edge. The iron tang is inserted into a wooden handle and is held in place by a very long slightly concave iron ferrule. The handle is of hard brown wood. A spur projection at the center is arranged as a hand stop, insuring firmness of grip. The position and shape of this spur vary among the different tribes employing the head ax and together with the form and size of the blade indicate tribal bent and tradition.

Length over all, 56.5 centimeters (22.2 inches); length of blade, 30.6 centimeters (12 inches); width of blade, 12 centimeters (4.7 inches); ferrule, 15.3 centimeters (6 inches) long; length of handle beyond the ferrule, 31 centimeters (12.2 inches). This is an early type of Igorot ax and was collected by the Admiral Wilkes exploring expedition, 1838–1842. Cat. No. 5654, U.S.N.M. (Pl. 1.)

Head ax, Moro, Mindanao.—The blade and handle in general similar weapons employed by the pagan tribes of northern Luzon. This ax has a chiseled blade and a projecting spike-shaped pole spur. The cutting edge is but slightly concave. The greatest projection of blade is at the outer rim in line with the spike pole at the back of the ax head. The blade is of such shape that it may be converted into an adz or an ax by revolving. The iron ferrule is unusually long, extending over half the entire handle length; it is slightly concave and is like an hourglass in outline. The handle beyond the ferrule is of red lauan and is shouldered with a short projecting spur placed immediately back of a grip constriction of the handle. The handle back of the shoulder is ferruled with numerous copper and silver filleted bands. The silver fillets are punched with figures in geometric pattern; the copper fillets are plain.

Length of handle, ferrule, and blade, 53.5 centimenters (21 inches); length of blade, 32 centimeters (12.6 inches); length of ferrule, 22.8 centimeters (9 inches). Collected by Mrs. H. C. Corbin. Cat. No. 258299, U.S.N.M. (Pl. 1.)

Beheading sword, Moro, Malabang, Mindanao.—This heavy steel chopping blade "tabas" (Moro) is convexly curved at cutting edge and concave at back, but broadens toward the abruptly truncated distal end. Distal end has a width of 9.7 centimeters (3.8 inches), while the end nearest the handle has a width of but 3 centimeters (1.2 inches). A well-defined median ridge extends the entire length of the blade, which is diamond shape in section. Handle has a two-handed grip section wrapped with rattan braid; pommel consists of highly polished red lauan wood provided with incised carvings arranged in parallel lines and in other geometric patterns inlaid with lime.

Length of blade, 51.6 centimeters (20.3 inches); length of handle, 37 centimeters (14.6 inches). Collected by Lieut. Col. George C. Shaw, United States Army. Cat. No. 324256, U.S.N.M. (Pl. 9, No. 1.)

Sword chopper, "*Pirah*," *Moro*, *Mindanao*.—The blade is long, crescentic, broad and heavy backed, sharp pointed, deeply bellied, and has elbow at the neck region or base of blade at the termination of the cutting edge. The handle grip is carved from ebonylike camagon wood, plain surfaced as to grip portion, and richly carved with finely shaped geometric surface etchings on pommel. Pommel is shaped with spike button and bilateral downward projecting recurved horns, which are symbolic. The scabbard is well formed, composed of two hollowed sections of red lauan wood glued together, highly carved on the outside, and rubbed with lime in incisions.

Length of weapon, 82 centimeters (31.5 inches). Collected by Mrs. Caroline E. Bates. (Pl. 9, No. 6.) Cat. No. 290488, U.S.N.M.

Talibong, *Moro*, *Mindanao*.—This variety of the Moro executioner's sword or talibong is rare. The blade possesses two curves forming a nearly complete sigmoid outline. The blade section nearest the handle extends downward or anteriorly in a prominent curve, while the posterior section of back is broad near the handle; it is sharpened toward distal end sector to a cutting edge similar to Cat. No. 232741, U.S.N.M. The heavy wood handle grip is two-handed and plain. Wrapping of cord and narrow bands of braided bejuco serve to keep the metal tang in position.

Length of weapon, 114.4 centimeters (3 feet 8 inches). Collected by J. W. Harkins. (Pl. 9, No. 5.) Cat. No. 213652, U.S.N.M.

Talibong, *Bagobo*, *Davao Province*, *Mindanao*.—A convexo-concave chopping blade formed with one great L-shaped angle near the center of its course, as in the Malay parong-latok. The blade is thin in section and diminishes uniformly from the back to cutting edge; back of blade is tapered from grip to distal end. A recurved billhook, which among other uses is employed in opening coconuts, projects from the distal end of blade at the center. This is also a characteristic feature of the Moro kampilan. Other projections at distal end are conventionalized survivals of a more ornamental design, but recur in almost identical pattern on most swords of this type. The surface of blade is rough and pitted; a crack on back near the center is due to bending of blade backward at an angle while being forged. There is no guard or washer; handle is designed for two hands and is formed of one piece of a white hardwood bisected for a distance of 16.8 centimeters (6.8 inches) from blade end for the insertion of flattened metal tang. Small bamboo splints are placed at the sides of the tang piece to close opening slits in grip.

Four forged iron bands and one of brass each of a different width and placed equidistant encircle the grip from sword neck to end of tang. Wrought-iron ferrules each 1.6 centimeter wide are filleted at each handle end.

Blade length, 53.5 centimeters (21 inches); handle length, 42 centimeters (16.5 inches). Collected by Misses E. H. and S. S. Metcalf. (Pl. 7, No. 2). Cat. No. 286244, U.S.N.M.

Grass bolo, Lake Lanao, Moro, Mindanao.—A chopping blade similar in shape to Cat. No. 286244, but somewhat shorter. It is employed in clearing the fields of grass rather than for fighting purposes. Both sides of blade are etched with continuous floral arabesque design, except in the sector near cutting edge. There is no median ridge present, but the blade is flattened in section. Handle is designed for two hands and is ferruled at both ends. Three additional forged bands are filleted near the tang end of handle, which is bisected for insertion of tang; division is continued throughout handle length. Wood rivets at both ends and in middle aid in holding sections firmly together.

Blade length, 42 centimeters (16.6 inches); length of handle, 38.5 centimeters (15.1 inches). Collected by Chaplain Joseph Clemens, United States Army. (Pl. 7, No. 3.) Cat. No. 257683, U.S.N.M.

Talibong, Moro, Mindanao.—A chopping blade with double sigmoid curve, truncated at distal end. Blade has resemblance to the "pirah," but is more abruptly truncated. The handle is heavy, tapering toward blade, and is fashioned to balance the extremely wide and heavy truncated distal blade end. Handle has guard washer and is filleted with ferrules of brass.

Length of blade, 46.5 centimeters (18.3 inches): width at truncated base, 8 centimeters (3.2 inches); length of handle, 28.7 centimeters (11.3 inches). Collected by Maj. H. G. Lyon, United States Army. (Pl. 9, No. 2.) Cat. No. 275715, U.S.N.M.

Pirah, Moro, Basilan Island.—A chopping blade with convex curve on cutting edge; back of blade has concave curve rising from the narrow proximal end and continuing for a distance of two-thirds the blade length. The maximum blade width of 7 centimeters (2.8 inches) is near distal end, from whence the slope tapers to a sharp blade point. Handle is formed from polished carabao horn with long projection at pommel. Hourglass-shaped brass ferrule as in the barong. Basilan Island.

Length of blade, 46.5 centimeters (18.3 inches); 34.4 centimeters (13 inches). Collected by Maj. H. G. Lyon, United States Army. (Pl. 12, No. 10.) Cat. No. 275713, U.S.N.M.

Headman's Ax, western Mindanao.—A chopping blade "talibong" resembling Cat. No. 286244 in its curvature and in the conventional design of the distal blade end, with its bill hook and other con-

ventionalized projections. The flattened lateral surfaces are plain, except for a chased floral design along margin near the back of blade. Handle formed of a hardwood and shod with ferruled iron bands.

Length of blade, 48.4 centimeters (19 inches). Collected by Dr. Robert B. Grubbs. (Pl. 9, No. 3.) Cat. No. 3496, U.S.N.M.

WEAPONS OF DEFENSE: SHIELDS AND ARMOR

SHIELDS

Distribution of Philippine shield types; function and materials employed.—The use of shields as a protective cover for the body to intercept a weapon and as a parrying instrument is generally practiced by all primitive peoples. Materials used in shield construction may be wood, hide, grass, basketry material, such as rattan, or of metal. The shields of the Philippines are usually of wood, though some are made of rattan and other basketry material, or of carabao hide. Small metal body shields of tin and iron, such as are made by the Nias Islanders in western Malaysia, do not occur in the Philippines. The shield there constitutes the principal defensive weapon, as armor composed of horn, shell, and metal, is in use only among the Moro and does not find application among the northern island nationalities. There are three types of Filipino shields—the round target shield, the oblong rectangular shield with prongs, and the oblong shield without prongs and usually with tasseled decorations along the lateral edges.

The most common type of Filipino shield as fashioned by the primitive Indonesians of northern Luzon is the oblong rectangular pronged parrying shield. The Tinggian, Kalinga, and other northern tribes use the shield in combat at close quarters. The three upper prong projections are brought down violently against the enemy's legs so that he is tripped; when he is prostrate, the other or looser shield end with the two projecting prongs is brought down over his neck. The victim can then be effectively decapitated with the head ax that the head-hunter always carries with him. Other tribes, such as the Bontok Igorot, have ceased to use the prongs, but still make their shields with short, blunt projections that have become merely a conventionalized outline. In this respect the Bontok show a decadence apparent also in their nonuse of the bow. Other tribes, such as the Ifugao, have suffered the shield to undergo still further changes, so that the outline is without the wavy end protuberances. Another northern Luzon tribe, the Apayao, makes an oblong shield having one long heavy prong at each end; this shows a local development of design of value in lending effectiveness to the shield as a club. Various oblong types with prongs occur elsewhere in Malaysia.

The general appearance of the shield is that of a trough 3 to 5 feet long and 10 to 12 inches broad.

The other type of rectangular Filipino shield occurs in Mindanao, among the Negritos, and the pagan Ilongotes of Luzon, Ibilao, and elsewhere. In this shield the high elevation of the median ridge is lacking, as are also the crests at the narrow ends. The wavy outline occurs instead along the longitudinal sides. The boss is rounded; longitudinal edges are sometimes convex and tasseled or fringed with tufts of hair. The surface is sometimes elaborately carved, as among the Bagobo, who are inclined to richly decorate all of their weapons and are equally capable in brass work and in wood carving.

The rounded shield of the Moro shows not Malaysian but Saracen influence. Some of these shields are even made of hides and skins, a material which is not used in the other types of Filipino shields. Most of these shields are made of wood, however, and some of them are inlaid with shell *Turbinella rapa*, which is also employed on the oblong Malaysian shields. The shield including a circular handle on the concave reverse is frequently made of one piece of wood with basketry rim consisting of a warp of heavy coils bound with a cross lacing of rattan.

Materials from which the shield is formed usually vary with the use to which this defensive weapon is to be subjected. Shields designed to serve as target for arrows were preferably fashioned from soft wood in which the arrow became embedded and so retained; shields designed to ward off blows from the sword or spear were constructed of extremely hard wood. Choice of materials for shield construction was also dependent in part on the prevailing fashion in weapon construction, so that, for example, the rectangular shields vary in dimensions from the extremely narrow troughlike longitudinal forms occurring in eastern Malaysia to dimensions in western Malaysia sufficiently wide to completely shelter a man.

Moro oblong tufted shields are similar to those of north Celebes and are produced mostly by the Moro living nearest to western Malaysia. The Rio Grande and the Cotobato River Valley tribes produce a heavier shield, without tufts of hair on boss and lateral edges, and use a hardwood, such as camagon, for reinforcing splints. The Jolo and other sea island Moro shields have a greater variety of form, more pronounced median ridge-pole elevation, also a greater obverse curvature from the top to base of body. Both types have inlay of lime on the carved wood surfaces and brass studs or rivets driven in the surface by way of ornamentation. The Bagobo shields have a diamond-shape extension at the top of "chief," purely ornamental; the surface is ornamented with beads and "dulao" dye;

these shields are narrower than the oblong Moro shields of similar type.

Rounded or circular carved wood shields appear to be more common to the central or Visayan Islands, although they appear as far to the south and southwest as the islands of the Tawi Tawi group. Among the Moro the circular shield also is employed as a head cover.

In describing the weapons of the Bontoc Igorot[8] Dr. A. E. Jenks gives the following data relative to the shields employed by the pagan tribes of northern Luzon:

Shields are universally made and used by the Igorot. They are made by the men of each pueblo, and are seldom bought or sold. They are cut from single pieces of wood, and are generally constructed of very light wood, though some are heavy. The hand grip is cut in the solid timber, is almost invariably made for the left hand, and will usually accommodate only three fingers, the thumb and little finger remaining outside the grip and free to press forward the upper and lower ends of the shield, respectively, slanting it to glance a blow of a spear.

Within the present boundary of Bontoc Province there are three distinct patterns of wooden shields in use in three quite distinct culture areas. There is still another shield immediately beyond the western border of the Province, but which is believed to be produced also in the Bontoc area.

First is the shield of the Bontoc culture area. It is usually about 3 feet long and 1 foot wide, is blackened with a greasy soot, though now and again one in original wood is seen. The upper part or "chief" of the shield is cut, leaving three points projecting several inches above the solid field; the lower end or "base" is cut, leaving two points. Across both ends of the shield is a strengthening lace of bejuco, passing through perforations from front to back. The front surface of the shield is most prominent over the deep-cut hand grip at the boss or "fess-point," toward which a wing approaches on both the dexter and sinister sides of the front of the shield, being carved slightly on the field. This is the usual Bontoc shield, but some few have meaningless straight-line decorations cut in the field.

In the Tinglayan culture area, immediately north of Bontoc, the usual shield is very similar to the above, except that various sections of both the face and back of the shield are of natural wood or are colored dull red. The strengthening of bejuco lacings and the raised wings are also found.

Still farther north is the Kalinga shield, a slim gracefully formed shield, differing from the typical Bontoc weapon chiefly in its more graceful outline. It is of a uniform black color and has the bejuco lacings the same as the others.

The fourth variety, made at Bagnen, immediately across the Bontoc border, in Lepanto, and probably also made and certainly used near at hand in Bontoc, is quite similar to the Bontoc type, but is smaller and cruder. It is uncolored, and on its front has crude drawings of snakes and frogs (or perhaps men) drawn with soot paint.

Banawi area, south of the Bontoc area, has a shield differing markedly from the others. It is longer, usually somewhat wider, and not cut at either end.

[8] Ethnological Survey Publications, vol. 1, p. 124.

The lower end is straight across at right angles to the sides; the upper end rises to a very obtuse angle at the middle. The front is usually much plainer than is that of the other shields mentioned.

TYPE SHIELDS IN MUSEUM COLLECTION

Oblong wooden shield, Moro, Mindanao.—Cut from one piece of hardwood with batten across one end strengthened with reinforcement of transversely placed wood strips. Ornamental design on borders and at center of shield consists of black and white painted bands, the white color serves as a filler in the incised sections between black bands occupying the embossed spaces.

Length of shield, 1 millimeter 19.6 centimeter (46 inches). (Pl. 1.) Collected by J. M. Harkins from the Mindanao Moro, November, 1901. Cat. No. 213689, U.S.N.M.

Parrying shield, Moro, Zamboanga, Mindanao.—Formed together with the handle from one piece of wood. Narrow in width and shaped transversely like a low arch with median ridge projecting transversely across center; body of shield has slightly concave longitudinal edges. Handle is placed at an angle across the body on the reverse. Obverse is plain, but reverse has carvings at the ends.

Length of shield, 68.7 centimeters (27 inches); width, 10 centimeters to 13 centimeters (3.9 inches to 5.1 inches). Collected by Dr. E. A. Mearns, United States Army, from the Moro of Zamboanga, Mindanao. Cat. No. 229966, U.S.N.M.

Oblong shield, Moro, Mindanao.—Formed from strips of brown hardwood, held together by clamps of palmwood across the obverse and reverse. Grip formed in wood; low boss in front; tufts of hair at edges. Outline form truncated at bottom, circular at the top, and wavy along longitudinal edges.

Length, 1 millimeter 40.4 centimeters (54 inches). (Pl. 1.) Cat. No. 247721, U.S.N.M. Collected by Lieut. Jesse R. Harris, United States Army.

Oblong shield, Moro, Mindanao.—The shield, including handle grip, boss or fess point, and reinforcing median ridge on the reverse side, is entirely constructed of one piece of carved wood of medium hardness. It is oblong with a diamond-shaped carved projection 5 centimeters (2 inches) high at the center of the top of the shield; the bottom or base is a separate piece, slightly concave as to lateral edges and flaring at the bottom in harmony with the concavity of the lateral edges of the dextral and sinistral sides of the body of the shield; the base is carved in three planes, with the central plane projecting for a distance of 2 centimeters. The later edges are slightly bellied along the central portion, concave toward the base, and ovoid toward the top; tufts of human hair decorate the edges at sides, top, and bottom; these tufts are placed along the edge at

intervals of from 1 to 3 centimeters and are fastened by means of small wooden plugs thrust into holes drilled into the body of the shield. The back or reverse of the shield has a reinforcing median ridge cut out of the solid; it is ornamented with meaningless geometric scrolled carvings above and below the handle grip, which is carved out of the solid just beneath the boss. The grip is quite small and fitted only to three fingers of the hand. Obverse side of the shield has small transversely placed splints of black camagon wood (*Diospyrus discolor*), which are laced to camagon splints of similar size on the reverse by rattan lacing passed through holes drilled through the body; the purpose of the splint weaving is to prevent the wood of the body from warping or cracking. Filletted incised lines follow the border, are cut transversely at the center, and extend in two long parallel bands down the entire central front of the shield, which is highly polished. Short black pyramidal lines of paint radiate in series of two, five, and six, each pyramidal-shaped panel being 2 centimeters long. Boss is 15 centimeters (5.9 inches) in diameter and resembles a truncated cone; a circular piece of shell, 1 centimeter thick, 4 centimeters in diameter, and highly polished, is placed on the boss point and is fastened with glue and a wooden pin driven through a hole at the center into the wood of the body of the shield. A suspension cord passes through median ridge at the top and bottom.

Length of shield, 107 centimeters (40 inches); greatest breadth, 26 centimeters (10.2 inches). Collected by the Philippine Island Commission, Louisiana Purchase Exposition. (Pl. 1.) Cat. No. 235244, U.S.N.M.

Tufted oblong shield, Moro, Mindanao.—This is a splendid example of Moro handicraft in wood carving. Both the obverse and the reverse sides are filled with minute incised carving in rickrack designs resembling diamond-shaped figures, the capital W, the swastika emblem, and other punctated and triangular-shaped figures. The body of the shield is formed of one piece of rather thin, light-weight, convexly rounded wood, flat at the top, convexly rounded at the base. The scalloped lateral edges are divided into three segments by transversely placed clamps of bamboo on both obverse and reverse sides at points approximately one-third and two-thirds the distance from the base to the top. The clamps are lashed together by wrappings of rattan passed through the body of the shield. The boss stands out in relief 4 centimeters (1.6 inches) above the shield; it is truncated and tufted at the top and sides with horsehair 10 to 15 centimeters (3.9 to 5.9 inches) in length. Lateral edges are similarly tufted with horsehair fastened with wooden plugs in holes driven in at the edges except near the top. A median ridge projects longitudinally across the center of

shield a distance of one-third the length; it is tufted and is carved out of the solid.

Length of shield, 94 centimeters (36.2 inches); width of shield at place of attachment of transverse wooden clamps, 37 centimeters (14.6 inches).

Collected by the Philippine Island Commission, Louisiana Purchase Exposition. (Pl. 1.) Cat. No. 235243, U.S.N.M.

Painted shield, Negritos, Luzon.—The shields of the Negritos are uniformly crude in workmanship and modeled after those of the Malayans with whom they have come in contact. This shield is a type found among the eastern Luzon tribes. It is formed from one piece of light-colored and medium-heavy wood, cut at the top and at the bottom, leaving three points projecting from the solid body of the shield. These points are identical at the top or chief and at the base. There is a spherical curvature of shield producing a uniformly concave surface on the reverse and convex on the obverse. The lateral edges are straight; handle grip is carved out of the solid like the majority of the Malayan shields. Reverse of shield is plain; obverse has rickrack border designs in carved incised patterns; border consists of banded lines in black paint. Two lizards patterned in black paint occupy the surface of the body of the shield. The boss is plain and consists of a shallow pointed elevation projecting from the carved body of the shield.

Length of shield, 76 centimeters (29.9 inches); width, 24 centimeters (9.5 inches). Collected by the Philippine Island Commission, Louisiana Purchase Exposition. (Pl. 1.) Cat. No. 235247, U.S.N.M.

Oblong carved shield, Moro Mindanao.—A beautiful specimen of Moro handicraft. Although similar in design and outline to the typical Moro oblong tufted shield, this specimen is unusually excellent in the detail of carvings and in type characteristics. It is formed from one piece of a light-brown colored wood, thin in section, somewhat thicker at the top, and is reinforced with two series of transversely placed flat strips of camagon wood facing one another on the reverse and obverse sides of the shield, each fastened together with three braided basketry bands of rattan passed through holes drilled through the body. These reinforcing or pilastering bands extend across the shield transversely at the two points of greatest width, that is at the tip of the scallops of the irregular lateral edges. The handle grip extends longitudinally across the center of the reverse and is cut out of the solid; a pocket is hollowed out to fit the finger grip just underneath the boss on the obverse. Carvings on the reverse and obverse are varied geometric, rickrack, and rectangular figures; many of these on the obverse are inlaid with lime. The general effect of the carved

etchings is that of a series of rectangular paneling on both sides which becomes a circular scroll-like design on the boss; the boss terminates in a truncated tufted surface; tufts of horsehair appear at the lateral edges from the base upward two-thirds the distance to the top. A suspension cord of native cotton and braided bark fiber reaches from the upper transverse reinforcing clamp to the lower.

Length of shield, 117 centimeters (3 feet 9 inches); width, 49.4 centimeters (19 inches). Collected by Arthur R. Fergusson. (Pl. 1.) Cat. No. 324373, U.S.N.M.

Shield with prongs, Igorot, Mountain province, northern Luzon.— Formed from one piece of hardwood of medium weight and durability. The body is cut at the top, leaving three projecting prongs extending 29 centimeters (11.4 inches) above the body of the shield, one at the center and one at each lateral edge. Another large section is cut from the body at the base, leaving two projecting prongs extending a distance of 35.5 centimeters (14 inches) below the body, one at each lateral edge. The prongs are rounded in section throughout their course and have a greater diameter than the body of the shield. The lateral edges are also rounded in section and have the same thickness as the extended prongs, which are thicker than the comparatively thin surface of the body. The body becomes uniformly narrower from the top to the base; it is concave on the reverse and convex on the obverse; the most prominent part is at the boss, under which lies the short but deep-set handle grip which is cut out of the solid. There is no reinforcing median ridge at this point serving also as a handle grip as in the Moro shields. Like the Moro and other Philippine shields, however, it is cut for the left hand and is so small as to accommodate only three fingers, leaving the little finger below and the thumb at the top outside the grip, to dexterously manipulate the shield in parrying a blow. Where the Moro shields have bamboo or hardwood clamps transversely placed across the face and reverse of the shield near the upper and lower thirds of the body, the Igorot shields have lacings of rattan passing through perforations in the body, which fasten the two parallel reinforcing strips of braided rattan bands, which pass entirely around the body of the shield. In addition to the diamond-shape relief carving of the boss area, two panels slightly elevated in low relief project in a circular outline from the top to the bottom on the obverse about a third the distance from the lateral edges. The shield is otherwise plain on both the reverse and the obverse; the color originally applied has the faded appearance of purplish indigo blue derived from indigo plants locally grown.

Length of body, exclusive of the projecting prongs, 56 centimeters (22 inches); width at top of body of shield, 26.5 centimeters (10.4

inches). Collected by the Philippine Island Commission, Louisiana Purchase Exposition. (Pl. 1.) Cat. No. 235245, U.S.N.M.

Rawhide shield, Bikol, Masbate Island.—The employment of hides as shields is rare in the Philippines and is usually limited to the Moro. This shield accompanies a suit of armor consisting of helmet and cuirass of rawhide described under the caption "armor." The hide of a water buffalo (*Bubalus buffelus*), or carabao, has been cut in roughly quadrangular form and the corners rounded. The hair has been partially removed from the obverse; to the reverse have been attached two semicircular arm-handle grips of the curved roots of a tree. The ends of each handle grip have been flattened so as to lie flat against the reverse side of the shield; they are fastened with a two-ply cord of abaca fiber of native manufacture which is passed through perforations in the body and looped over the ends of the arm grip. This type of arm grip is usual in the circular Malayan shields. The entire shield is crudely made and obviously does not represent the best production of the workmanship of the Bikol.

Diameter of shield circumference, 53.5 centimeters (31 inches). Collected by Gen. James M. Bell, United States Volunteers. Cat. No. 209350, U.S.N.M. (Pl. 1.)

Circular shield, Bagobo, Mindanao.—Formed from one piece of light-weight wood, hollowed on the reverse, convex on the obverse; the double hand grips carved out of the solid are slanted toward one another in semilunar projections; one is fitted for the insertion of the forearm, the other serves as a hand grip. The grip section is polished through use. Carving on the reverse consists of buttresses or extensions at both ends of the two handle grips extending to the outer-rim circumference; the carving in low relief gradually becomes more prominent until terminating in the hand grip itself. Along the borders of the pilastering are incised rickrack patterns. The obverse side is banded with encircling strips of black paint. Between the painted bands and bordering the same are incised rickrack patterns. The boss is but slightly elevated above the convex surface of the body. The shield is an old specimen.

Length of diameter of shield, 70 centimeters (27.5 inches). Collected by the Misses E. H. and S. S. Metcalf. Cat. No. 286246, U.S.N.M. (Pl. 1.)

Circular hardwood shield, Moro, Mindanao.—With the exception of the boss, which is inset with a glass button, the entire shield, including the grip, is cut out of the solid. Like all circular shields of the southern Philippine Islands, the obverse is convex and the reverse has been hollowed. The grip is circular and has four pedestal supports, giving it an elevation sufficient for the insertion of the

hand and forearm. Surface is plain. The circular grip is so fitted as to allow the shield to be worn as a hat or head covering.

Diameter of circumference of shield, 65.4 centimeters (25.7 inches). Collected by Lieut. Col. George C. Shaw, United States Army. Cat. No. 324226, U.S.N.M. (Pl. 1.)

Carved wooden shield, Moro, Cotobato Valley, Mindanao.—Circular shields of the southern Philippine Islands are more crudely constructed and heavier than are oblong shields from the same area. The reverse is hollowed and undecorated; the obverse is convexly rounded like a flattened cone, as are all shields of the circular type; it is carved with the emblematic hemispherical or rising-sun pattern and has additional floriated surface designs incorporating an ogee curve around the border and surrounding the central elevation of the boss. The decorative design is further enhanced with alternate colorings—the cut sections in white and the embossed portions in black. A reinforcing strip of bamboo encircles the outer circumference and is fastened with wooden pegs driven into the lateral edges of the body. The double grip for the left hand and forearm is cut out of the solid and is supported by a fourfold pilastering, likewise cut out of the solid.

Diameter of circumference, 58 centimeters (22.8 inches). Collected by Capt. Thomas W. Darrah, United States Army. Cat. No. 213429, U.S.N.M. (Pl. 1.)

Carved wooden shield, Moro, Balimbang, Tawi Tawi group.—The wood used in this shield is unique in that it is extremely heavy, light in color, and unpainted. The handle grip is double and is designed to include the left hand and forearm. There is no pocket cut out of the body from under the boss. This characteristic is noticeable on all similarly formed shields; it is only the arched oblong shields that have the necessary room for a handhold to be carved from out the body of the shield. On both reverse and obverse sides the shield has deeply cut ornamental designs representing conventionalized arabesque design so characteristic of carvings on the hilts and grips of the metallic weapons of the southern island tribes. This form of embossed shield is repeated in basketry and occurs in Borneo and adjoining islands.

Length of diameter, 68 centimeters (26.7 inches). Collected by Dr. E. A. Mearns, United States Army. Cat. No. 247112, U.S.N.M.

Oblong shield, Kalinga, north central Luzon.—This weapon of defense is an old specimen and shows a high quality of artistic workmanship in wood. The shield is formed of wood of medium weight, but is unusually thin in section. It is cut entirely from one piece and belongs to the generalized type of pronged oblong shields produced by the tribes of central northern Luzon. This specimen differs

from the Igorot shield in that the cut portions at the top and base are less in width. The uncut sections left projecting from the body of the shield are as long as those found on Igorot shields, but they are ornamental and would prove quite inefficient weapons in personal combat. The paneling on the obverse is similar to that occurring in Igorot shields and consists of straight sections carved from the solid in low relief near the lateral edges, and of curved sections facing the central elevation of the boss. In a general way the shield is convex on the obverse and circularly concave on the reverse. On both sides occur painted designs consisting of banded longitudinal strips and small interlocking cell-like designs having six sides resembling a honeycomb. There is no median ridge elevation and the three-finger grip is cut out of the solid underneath the boss elevation.

Length of body of shield, 61.5 centimeters (24.2 inches); breadth of shield at center, 27.6 centimeters (10.8 inches). Collected by Arthur R. Fergusson. Cat. No. 324372, U.S.N.M.

Oblong shield.—Carved from light wood, plain on the reverse and painted a blue-black with indigo on the obverse. Handle grip carved out of the solid; no median ridge reinforcement; general form elbow or roof shape in section. Surface carving representing a snake seizing a deer; carving in low relief and painted green. Ornamental stubs at top and base of shield, two at the top and one centrally placed at the bottom.

Length of shield, 104 centimeters (40 inches); width, 22.4 centimeters (9 inches). Collected by Colonel Johnson, Fifteenth Cavalry, United States Army, and presented by Douglass N. Starr. Cat. No. 305658, U.S.N.M. (Pl. 1.)

Oblong practice shield, Moro, Lake Lanao, Mindanao.—Narrow oblong wooden shield with lateral edges incurved and scalloped. Crudely constructed and unpainted. Used by boys to learn the war dances. They whirl in the dance with muscles and nerves tense until pale and exhausted. A practice sword accompanying the shield is also made of wood.

Length of shield, 96.2 centimeters, (37 inches); width, 13 centimeters (5 inches.) (Pl. 1.) Collected by Chaplain Joseph Clemens, United States Army. Cat. No. 257693, U.S.N.M.

Oblong wood shield, Bagobo, Mindanao.—Formed from one piece of hardwood with the exception of a small additional section glued on at the base. The shield is flat in section and is uniformly curved in double sigmoid curve with greatest obverse projection at center, at top, and at base. The characteristic diamond-shape stub projects from the body at the top; lateral edges are straight at central sector and incurved at top and base. An inlay of small white shell beads surrounds the border and fills in two parallel filleted incised grooves

on the obverse extending from the top to the bottom of the shield at the center. These shell beads are of the same variety as the larger shell piece capping the truncated boss elevation. Reverse of shield is plain. A median ridge elevation extends from upper transversely placed reinforcing clamps to the lower similarly placed clamps. Grip cut out of the solid underneath the boss elevation.

Length of shield, 122 centimeters (43 inches); width, 24 centimeters (9.5 inches). Collected by Misses E. H. and S. S. Metcalf. Cat. No. 286247, U.S.N.M. (Pl. 1.)

Oblong shield, textile pattern, Bagobo, Mindanao.—This oblong wooden shield is one of the most beautiful examples of Bagobo handicraft. The outline conforms to the generalized type of oblong shield occurring in the southern islands of the Philippine Archipelago. The breadth of the weapon combined with the sectional thinness is unusual. Reinforcing splints of bamboo are placed transversely near the incurved top and base. Convexity of the obverse side is such as to inscribe a semicircle. The scalloped lateral edges are inset with tufted human hair, cut in tufts 10 to 12 centimeters long. Both the obverse and the reverse sides have carvings covering surfaces except on the central panels. Figured designs are minute, variegated, and probably meaningless; they represent a conventionalized arabesque floriated and other geometric designs in rickrack pattern, consisting of diamond shape, triangular, quadrangular, swastika, and other figured patterns arranged in longitudinal contiguity.

Length of shield, 97 centimeters (37.3 inches); breadth, 38 centimeters (14.9 inches). Collected by the Misses E. H. and S. S. Metcalf. Cat. No. 286249, U.S.N.M. (Pl. 1.)

BODY ARMOR AND HELMETS

Distribution of the cuirass and helmet; origin; materials employed.—Body armor is common to the Indonesian war complex. It occurs not only among the primitive Indonesian tribes in the Philippines, but among the primitive Malayans elsewhere in western Malaysia. Materials employed are the bark of trees, as in Nias Island, or sheet metal of tin, or thin iron plate, horn, or brass, or they may be made of rattan or cotton quilting. Corselets of hardwood, horn, or brass occur in widely separated areas in Malaysia and show adaptations of primitive Malay, ancient Hindu, or Spanish design. The Moro fashion coats of mail from plates of brass or of carabao horn joined with chain armor of brass or iron.

A similar complexity of origin is manifested in helmets worn by the Moro. In design and ornamental work they are copies of ancient Spanish helmets, but helmets of tin or thin iron sheeting also occur among the Indonesian tribes further to the east. It is quite

probable that some of the early tribes employing iron in the Philippines fashioned similar iron helmets and body armor, and later produced more ornamental brass armor and helmets in imitation of the Spanish. Furthermore, many of the so-called Moro helmets were not made by the Moro, but are helmets of ancient Spanish manufacture, which have been preserved by the Moro pretty much as they have preserved the old Chinese war gongs of brass. On the other hand, there are many beautiful examples of Moro and Bornean brass helmets and body armor now included in museums or in private collections erroneously described as dating back to this or that ill-fated Spanish expedition.

The survival in use of body armor by the Moro as late as 1904 is asserted in the following communication from Dr. E. A. Mearns, United States Army, a member of an American punitive expedition under General Wood:

> Datto Huahulama's cotta (fort) in a remote part of the Taraca Valley, Mindanao, was reduced and taken from 12 m. to 1.30 p. m., April 7, 1904, by a squadron of Cavalry commanded by Alonzo Gray, which I accompanied, and noted the following: As we entered the fort I found a suit of plaited armor, composed of carabao horn and carabao leather. This was a splendid piece of workmanship; many were seen in the Lake Lanao region that were made entirely of leather, and helmets of carabao horn were not uncommon.

The weight of one of the coats of brass and horn mail is excessive, those in the Museum collection average from 20 to 25 pounds, and their length is such as to reach to the knees of the wearer.

Measurements of one of the coats of brass plate and chain armor now in the Museum, Cat. No. 288210, U.S.N.M., presented by Maj. and Mrs. Edgar Russel, are as follows: Width across shoulders, 65 centimeters (25 inches); length from shoulders, 71.3 centimeters (27½ inches); skirt composed of 15 pairs of vertical plates; waist composed of 12 pairs of vertical plates; horizontal plates on each front of shoulder, 3; horizontal plates on upper back, 4 rows or 4 horizontal plates; lower row of plates, 15.

TYPE SPECIMENS OF BODY ARMOR IN MUSEUM

Cuirass, Moro, Mindanao.—This corselet is made of the rawhide of carabao and is fashioned to fit the body. Openings are cut out of the solid to make an aperture for the head, the sections remaining form shoulder straps; other openings are allowed for the arms. The rawhide originally was a long rectangular piece which, after the apertures were incised, was folded over on itself so as to form a front and rear section to cover the chest and the back of the body. The rawhide before drying was further fitted to the body by means of slashes cut in the hide longitudinally about 3 to 4 centimeters apart and vertically in front and at the back near the portion fitted over the neck and shoulders. This arrangement permitted modeling.

The lower ends of the cuirass are turned up and outward so as not to interfere with the leg movement of the wearer. The material has become brittle and no doubt was in that condition when worn by the Moro. Were it not for the unsecured openings at the sides and under the armpits, it would be almost impossible for the ordinary sized Malay Moro to put on this coat of armor. The piece was found in the same house with an ancient Spanish cuirass, together with a heavy leather skirt, obviously also of foreign production.

Diameter, 27.5 centimeters (10.8 inches); height, 41 centimeters (16.2 inches). Collected by Lieut. Jesse R. Harris, United States Army. (Pl. 1.) Cat. No. 247716, U.S.N.M.

Suit of armor, Bikol, Catanduanes Island.—The suit consists of a helmet, cuirass, and a shield; the shield has been described under the general caption "Shields." As noted before, employment of rawhide as material for coats of mail is rare in the Philippines; the crudity of workmanship betrays the fact that unusual conditions must have dictated the choice of this material. The helmet consists of a conical fold of rawhide formed by sewing two ends of an oblong rectangular section of hide together with two-ply native cord of abaca fiber. This forms a funnel-shaped helmet with a neck flap covering the rear of the neck. The helmet stands 26.5 centimeters (10.4 inches) high when placed vertically.

The cuirass is formed of the same material, carabao rawhide, and is short and sleeveless, designed to protect the trunk only. There are wrappings of cotton cloth about the neck and armhole openings bound with abaca cord; provisions are made at the sides, underneath the armholes, and down the front for lacings of similar cord. Hide armor is exceedingly rigid and cumbersome. It represents a late introduction in the southern islands.

Collected by Gen. James W. Bell, United States Volunteers. Cat. No. 209350, U.S.N.M. (Pl. 1.)

Cuirass, Moro, Mindanao.—This corselet is designed for use in war and is excellently made. It is closely woven of heavy two-ply abaca cord worked in a complex double weave nearly 1 centimeter thick. The underside of the arm pieces are open, allowing for articulation of the arm joints; the bottom ends of the cuirass are made of 12 flaps, edged with braiding of rattan splints, allowing for leg movements. A loose-fitting collar incloses the neck. The opening at the front is closed with lacing of abaca fiber.

Length of cuirass, 74,8 centimeters (28 inches); weight, 10 pounds. Cat. No. 216973, U.S.N.M. (Pl. 1.)

Coats of mail, Moro, Iligan, north Mindanao.—Chain and plate armors are splendid examples of a medieval pattern dating back to the fifteenth century. The plates of the specimen (Cat. No. 3478, U.S.N.M.) are of brass, while those of the coat (Cat. No. 3479.

U.S.N.M.) are of carabao horn. Undoubtedly the latter is of Moro manufacture in so far as the carabao horn plates and metal ornamentation thereon are concerned. The brass plates on the former, however, and the copper rings on both specimens must be ascribed to the Spanish, as the quality of the chain work exceeds anything of the kind known to be purely of local Moro origin. The chain rings are regularly attached to four neighboring rings, as usually occurs in European chain armor; each link is carefully closed but is not riveted. Bashford Dean in Handbook of Arms and Armor, published by the Metropolitan Museum of Art, calls attention to the fact that "while European mail was rarely made after 1600, the oriental armorers produced large quantities of chain shirts during the seventeenth and eighteenth centuries. Only in the technical details do these differ from German or Italian examples." Ornamentation on both specimens consists of thin silver leaf stamped in a floriated design which is characteristic of Moro art. They are attached to the underlying brass or horn plates by means of copper rivets. Buckles of silver patterned in floriated ornamental design serve to fasten the frontal plates together. The sleeves are made entirely of chain links and are quarter length. Worn by the Moro of Iligan, Mindanao, in 1903.

Collected by Dr. Robert B. Grubbs, United States Army. Cat. Nos. 3478–3479, U.S.N.M. (Pl. 15, Nos. 3–4.)

TYPE SPECIMENS OF BRASS HELMETS

Brass helmet, Moro, Mindanao.—This metal helmet, formerly employed by the Moro, is made of cast brass. The helmet resembles the European burganet or morion which was commonly worn during the middle of the sixteenth century by the armored knight, especially as a protection against gunfire at close range. Such burganets were undoubtedly worn by Europeans in their warfare in the East Indies, although it is possible that the type of head armor worn by the Spanish in their expeditions against the Moro were of a somewhat different type. A painting by the Filipino artist, Juan Luna, which is now in the Ayuntamiento, represents the famous Spanish explorer Legaspi and his followers in the act of performing the blood compact with the Bohol datto Sicatuna. Legaspi and his following are here represented as wearing a later type of helmet resembling the cabasset, a simpler form which has lost many of the details of the more burdensome burganet.

The Moro helmet here described is cast in one piece and has but one movable section, the ear or cheek flaps, which are attached by a hinge. The neck piece is a short, simple, recurved flange at the back resembling the umbril or visor, which extends downward at

the front of the oval helmet bowl. A high narrow crest extends from the base of the helmet bowl at the front to the base of the bowl at the back. It is ornamented with an openwork floriated arabesque pattern resembling that found on the ornamental sections of Moro weapons and contains the characteristic ogee curve arranged in several combinations. Similar openwork ornamental patterns occur at the front umbril and on the neck piece. The helmet is provided with a plume holder placed low at the front on the left side of the crest. The placing of the plume holder at the front and the characteristic floriation are of the plumed pompon of Malaysian origin, while the helmet as a whole is a copy of the Spanish helmet. The weight is but 4 pounds, although some of the brass helmets cast by the Moro, now in the Museum, weigh as much as 6 pounds.

The pompon inserted in the plume holder is 59 centimeters (23.2 inches) in height and is composed of three feathered plumes of equal height, placed on a framework of wood. Each is wrapped with red cord and terminates at the base in a funnel-shaped wooden sleeve. It is supported by three bamboo brackets extending one-half the length of the plumes. Another pompon reaching only one-half the height of the three plumes is placed at their back. This is composed of a section of palm leaf to which have been sewn tufts of hair and feathered bamboo splints. An ornamental piece composed of two series of upright splints extending respectively one-third and two-thirds the length of the taller pompons is socketed in the funnel-shaped wooden cylinder which contains the pompons and feathered palm leaf. Immediately back of the uprights is a thin slab of perforated wood 0.5 centimeter thick, reaching to the same height as the upright. The bracketed plumes are lashed to this slab from the back and to the upright splints at the front. In front of the uprights are placed three series of cut sections of palm leaf cut to resemble pairs of birds' wings and covered with red cloth and gilt metal leaf (tinfoil). They are arranged in three superimposed series, the second and the third, respectively, each being longer by one-third the length than the one in front of it.

Height of helmet to top of crest, 25 centimeters (9.8 inches); length from tip of visor to tip of neck piece, 33 centimeters (13 inches). Collected by Gen. R. D. Potts, United States Army. Cat. No. 327146, U.S.N.M. (Pl. 15, No. 2.)

Brass helmet, Moro, Iligan, north Mindanao.—The helmet, including visor or umbril, crest, and neck piece, is cast in one piece. Cheek flaps are small and are attached to the base of the helmet bowl by means of a hinge; the hinge rod is a worn cord of abaca fiber knotted at each end. The crest, plume holder at the left front of crest, and the bowl of the helmet at the back and at the sides are ornamented

with openwork arranged in decorative arabesque pattern characteristic of the Moro designs on parang pommel and blade. Lines of embossed frets ornament the margins of helmet bowl and form a panelwork pleasing in effect.

The pompon plume of feathers and tinsel is 54 centimeters (21.2 inches) high. The plume is composed of sections fitted into one another which teminate at the base in a wooden spike and seven plumes of feathered tufts wrapped with variously colored cord. Two similar plumes are respectively two-thirds and one-third the length of the taller plume. A wrapping of red cloth incloses the plumes for a distance of several inches above the holder.

Height of crest from bottom of visor, 23 centimeters (9 inches); length of helmet from visor to neck piece, 32.5 centimeters (12.8 inches). Collected by Dr. Robert B. Grubbs, United States Army. Cat No. 3477, U.S.N.M. (Pl. 15, No. 1.)

BIBLIOGRAPHY

Barrows, D. P. A History of the Philippines. Indianapolis, 1905.

Barton, R. F. Ifugao Law. Berkeley, 1919. University of California Publications in American Archaeology and Ethnology, vol. 15, no. 1.

Beyer, H. Otley. Population of the Philippine Islands in 1916. Manila, 1917. Written in Spanish and English. The volume includes statistical tables, a good bibliography, and a tribal dictionary of Philippine ethnology.

Blair, Emma Helen, and Robertson, James Alexander. The Philippine Islands: 1493–1898. Cleveland, 1903–1909. 55 vols. A collection of source material.

Blumentritt, F. Die Chinesen auf den Philippinen. Eine historische Skizze. Jahres-bericht der Communal-Oberrealschule von Leitmeritz. Leitmeritz, 1879.

Brough, Bennett H. The Early Use of Iron. Manuscript published for private circulation.

Census of the Philippine Islands, 1903. 4 volumes, Washington, 1905.

Christie, E. B. The Subanuns of Sindangan Bay. Manila, 1909. Division of Ethnology Publications, Bureau of Science. Vol. 6, No. 1, 29 pls.

Cole, F. C. The Tinggian. The Philippine Journal of Science, vol. 3, Section A, pp. 197–213, 9 pls. Manila, 1908.

——— The Wild Tribes of Davao District, Mindanao. Field Museum of Natural History, Anthropological Series, vol. 12, no. 2. Chicago, 1913.

Dean, Bashford. Handbook of Arms and Armor. The Metropolitan Museum of Art. New York, 1915.

Hough, Walter. Synoptic Series of Objects in the United States National Museum Illustrating the History of Inventions. Washington, 1922.

Jenks, A. E. The Bontoc Igorot. Manila, 1905. Ethnological Survey Publications, vol. 1, 155 pls.

Knight, Edward H. A Study of the Savage Weapons at the Centennial Exhibition, Philadelphia, 1876. Washington, 1880. Smithsonian Annual Report for 1879.

Kroeber, A. L. Peoples of the Philippines. Handbook Series No. 8, American Museum of Natural History. New York, 1919.

Laufer, B. The Relations of the Chinese to the Philippine Islands. Smithsonian Miscellaneous Collections, vol. 50. Washington, 1907.

Miller, Edward Y. The Bataks of Palawan. Manila, 1905. Philippine Ethnological Survey Publications, vol. 2, pp. 179–189, 6 pls.

Miller, H. H. Commercial Geography. The Materials of Commerce for the Philippines. Manila, 1911.

Pleyte, C. M. Sumpitan and Bow in Indonesia. Leiden, 1891. Internationales Archiv fuer Ethnographie, vol. 4, pp. 265–281, 4 pls.

Reed, W. A. Negritos of Zambales. Manila, 1905. Ethnological Survey Publications, vol. 2, pt. 1, 62 pls.

Root, Elihu. The People of the Philippines. Letter from the Secretary of War. Washington, 1901. Senate Document No. 218, 56th Congress, 2d session.

ROTH, H. LING. The Natives of Borneo. Edited from the Papers of the late Brooke Low. London, 1893. The Journal of the Anthropological Institute of Great Britain and Ireland, vol. 22, p. 52.

SALEEBY, N. M. Studies in Moro History, Law, and Religion; the History of Sulu. Manila, 1905, 1908. Bureau of Science: Division of Ethnology Publications, vol. 4, nos. 1–2, pp. 1–391.

SCHADENBERG, ALEXANDER. Ueber die Negritos der Philippinen. Berlin, 1880, Zeitschrift fuer Ethnologie, vol. 12, p. 134.

———— Die Bewohner von Sued Mindanao und der Insel Samal. Berlin, 1885. Zeitschrift fuer Ethnologie, vol. 17, p. 8, 2 pls.

SHELFORD, R. A Provisional Classification of the Swords of the Sarawak Tribes. London, 1901. The Journal of the Anthropological Institute of Great Britain and Ireland, vol. 31, 2 pls.

SULLIVAN, L. R. Racial Types in the Philippine Islands. New York, 1918. Anthropological Papers, American Museum of Natural History, vol. 23, pt. 1.

WORCESTER, DEAN C. Headhunters of Northern Luzon. Washington, 1912, National Geographic Magazine, vol. 23, no. 9 (fully illustrated).

———— The Non-Christian Peoples of the Philippine Islands. Washington, 1913, National Geographic Magazine, vol. 24, no. 11.

———— The Non-Christian Tribes of Northern Luzon. Manila, 1906. The Philippine Journal of Science, vol. 1, pp. 791–875, 67 pls.

EXPLANATION OF PLATES

Plate 1

Philippine weapons of offense and defense. Spears, lances, and halberds. Bows, arrows, and arrow cases. Blowguns, darts, and dart cases. Clubbed weapons and shields. Hand weapons for piercing and stabbing. Bolos. Cutting and slashing blades. Swords for cutting and chopping. Beheading swords. Head axes. Straight and wavy krisses. Circular shields for parrying and targets. Oblong, pronged, clubbed, and tufted shields of hollowed wood. Body armor of horn, hide, cordage, and fiber construction.

Plate 2

Projectile weapons: Blowguns, bows, arrows and darts, quiver and dart case. No. 1. Palmwood bow; highly polished, grooved, concavo-convex self-bow. Negritos, Zambales Mountains, Island of Luzon. 2. Heavy palmwood self-bow; flat surfaces, slightly concave on inner side. Negritos, Negros, Visayan Island, P. I. 3. Palmwood bow wrapped with rattan. Bagobo, Mindanao. 4. Palmwood bow; cord of bamboo splint. Moro, Mindanao. 5. Bamboo blowgun: Surface decorated with burned spiral bands and rings; lining tube of reed, sight elevation. Batak, Island of Palawan, Philippine Archipelago. 6. Arrow case of bamboo provided with rattan basketry cap. Moro, western Mindanao. 7. Blowgun darts and dart case. Batak, Palawan Island.

Plate 3

Simple and compound arrowheads of palmwood and bamboo. No. 1. Palmwood arrowhead and bamboo shaft. Moro, Mindanao. 2. Reed arrow with palmwood foreshaft. Moro, Mindanao. 3. Bamboo arrow with palmwood foreshaft; poisoned bamboo arrow point inserted in foreshaft. Bikol, Luzon. 4. Large arrow of bamboo with arrowhead of split bamboo. Bagobo, Mindanao. 5. Triangular shape arrowhead of bamboo, harpoon shaft. Negritos, Zambales Mountains, Luzon. 6. Barbed, triangular bamboo arrowhead, harpoon shaft. Negritos, Zambales Mountains, Luzon Island. 7. Fish arrow with compound head of bamboo. Bagobo, Mindanao. 8. Three-pronged or trident compound arrow. Negritos, Zambales Mountains, Luzon.

Plate 4

Metallic harpoon and arrowheads provided with barbed, hastate, three-pointed, harpoon, and composite points. Shaftments. No. 1. Short, flat, lanceolate arrowhead designed to make a large wound and to cause profuse bleeding. Negritos, Zambales Mountains. 2. Long, triangular, iron arrow point, palmwood foreshaft, unfeathered cane shaft. Moro, western Mindanao. 3. Small lanceolate shape Iron arrowhead, long bamboo shaft; heavy palmwood foreshaft, bulbous at the base. Old Bikol arrow type. 4. Leaf-shape arrow point of sheet copper, bamboo shaft, foreshaft of wood fast set in shaft with resin.

Moro. 5. Feathered bamboo shaft, large lanceolate shape arrow point. Negritos, Luzon. 6. Leaf-shape iron arrowhead of excellent workmanship socketed on hardwood shaft, no foreshaft. Moro, Jolo Archipelago. 7. Large feathered bamboo shaft, hastate shape iron arrow point. Negritos, Luzon. 8. Small triangular iron head, palmwood foreshaft, reed shaft. Moro, Mindanao. 9. Ferruled wooden shaft, long hastate shape barbed iron arrow point. Moro. 10. Long quadrangular barbed iron arrowhead. Negritos, Luzon. 11–13. Composite arrow shaftments; feathered shaft provided with lanyard and retrieving cord, barbed toggle harpoon type of arrow point. Designed for hunting pigs. Negritos.

Plate 5

Ceremonial, war, fishing, and hunting spears: Barbed, serpentine, harpoon, and compound types of iron and steel spearheads. No. 1. Hunting spear, harpoon type, bilaterally barbed. Moro, Mindanao. 2. Compound spearhead provided with three barbed prongs for use in fishing. Moro, Sulu Archipelago. 3. Serpentine form of steel spearhead socketed on palmwood shaft, shaft wound with plaited rattan and ferruled with brass. Mindanao. 4. Serpentine shape steel lance blade socketed on wooden shaft. Moro, Mindanao. 5. Iron war spear: Bilaterally recurved barbs, palmwood shaft wrapped with braided rattan, iron ferrule. 6. War spear: Hastate shape spear point provided with recurved guard barbs, metal tang inserted in hardwood shaft. Northern Luzon. 7–12. War spears: Multiple barbed iron spear points, short hardwood shafts wrapped with braided rattan ferrules, iron cap or spud socketed on base of shafts. Igorot, northern Luzon. 11. Ceremonial spear provided with multiple barbs to frighten spirits or "anitos." Igorot, northern Luzon.

Plate 6

Spears used ceremonially and in war; shafts ornamented and figured with brass and silver overlay. No. 1. Cane shaft, rough-surfaced iron blade of good form. Moro. 2. Elliptic spearhead of iron with socket. Igorot, Luzon. 3. Bilaterally barbed iron spearhead with socket. Luzon. 4. Brass pike head: Two mythical bird figures supporting blade. Blade and socket engraved with geometric figures. Moro. 5. Fine workmanship in iron shown in deeply grooved and socketed spearhead; shaft ferruled with figured silver. Shaft is tasseled and capped with a spud of carabao horn at base. Moro, Mindanao. 6. Head of fine ironwork, deeply grooved and provided with median ridge. Ferrule of brass, collar cord and tassel, rattan shaft capped with spike at basal end. Moro. 7–8. Steel blades, shafts of palmwood wrapped with brass wire: Figured brass ferrule, Bagobo, southeastern Mindanao. 9. Long iron blade, iron ferrule at neck; banded rings of rattan on shaft, tassel cord. Moro, Mindanao. 10. Blade of iron, thickened at distal end and tapering toward shaft, hardwood shaft ferruled with rattan and punched with brass rivets. Northern Luzon. 11. Short and broad iron spearhead fastened to rattan shaft by iron tang. Looped cord attached to neck of blade and to foreshaft of hardwood. Moro, Mindanao. 12. Finely wrought-iron spearhead; brass ferrule and iron shaft socket; hardwood shaft wound with spirals of figured brass and sheathed with alternating brass and silver bands. Bagobo, Mindanao.

Plate 7

Slashing and chopping blades: Kampilan and talibong. No. 1. Straight-edged steel kampilan, captured by the expedition under Capt. J. J. Pershing,

1903. Moro, Lake Lanao, Mindanao. 2. Curved and spiked steel talibong. Bagobo, Mindanao. 3. Curved and spiked talibong (grass cutter). Moro, Lake Lanao, northern Mindanao. 4. Kampilan blade with arabesque (floriated) etching on blade surfaces. Moro, Lake Lanao region, northern Mindanao.

Plate 8

Basketry bolo cases and knife sheaths. No. 1. Basketry parang and bolo scabbard. Rattan splints woven in hexagonal openwork at sides; framework of rattan. Basilan Island, Sulu Archipelago. 2. Combined knife sheath and reticule. Made from multiple folds of bast fiber; suspension cord of abaca. Batak, Palawan Island. 3. Bamboo bolo case. Cylindrical joint of bamboo with one end plugged with a split wooden disk; bound with braided rattan. Batak, Palawan Island. 4. Basketry bolo case made of woven rattan with wood base; suspension cord with belt attachment. Basilan Island.

Plate 9

Two-handed chopping and cutting parangs. No. 1. Heavy steel beheading blade "tabas." Curved and truncated like a scimitar; long curved double-handle grip wrapped with braided rattan and inlaid with lime. Moro, Malabang, Mindanao. 2. Heavy chopping blade "talibong," double sigmoid curve. Two-handed carved wooden handle hooped with brass bands. Moro, Mindanao. 3. Headsman's ax "talibong." Moro, western Mindanao. 4. Beheading sword and chopping blade "talibong." Heavy double-edged curved blade. Moro, Mindanao. 5. Heavy two-edged blade with sigmoid curve. Hexagonal wooden handle curved and wound with rattan splints. Moro, Mindanao. 6. Broad backed, deeply concave blade "pirah." Convexly curved cutting edge and long point. Elbow at base of blade near guard piece similar to the parang-latok of the Dyaks of Borneo; figured wood handle provided with symbolic recurved horns and median spike. Southern and Visayan Islands.

Plate 10

Head axes. Primitive Malayan and Indonesian tribes of north central Luzon. No. 1. Head-hunter's ax. Hardwood handle ferruled and shod with silver and brass bands. Kalinga, north central Luzon. 2. Head ax. Made of iron with bowed back and crescentic cutting edge; metal tang set in hardwood handle provided with long, hourglass-shape iron ferrule; handle equipped with carved hand-fitting grip and spur extension for hand support; plain surfaced. Kalinga, north central Luzon.

Plate 11

The barong: Specialized ornamental parang types. No. 1. Lanceolate shape broad-backed steel blade of exceptional excellence; hardwood handle grip sheathed with silver; pommel fashioned of dugong ivory in ornamental pattern of scrolls and fretwork; characteristic flat-surfaced hardwood scabbard. Moro, Mindanao. 2. Lanceolate, broad-backed blade; handle shod with ferruled silver bands and silver-braided wire; scrolled hardwood pommel. Presented to President Theodore Roosevelt by the Samal Moro, Basilan Island.

Plate 12

The bolo: Combination piercing and chopping weapons; agricultural knives and jungle tools. No. 1. Curved blade of steel with flattened surface on inner side and median ridge on beveled outer surface; octagonal hardwood handle. Tagalog, central Luzon. 2. Bolo with steel blade point broken off. Handle consists of elaborately carved carabao horn. Luzon. 3. Broad-backed steel blade provided with convex cutting edge; handle completely shod with figured brass. Bagobo, southern Mindanao. 4. Bolo having chased iron blade inlaid with soft metal; beautifully carved carabao-horn handle. Cebu, Visayan Islands. 5. Boy's barong; small elliptic steel blade; carved hardwood handle ferruled with silver bands and braided silver cord. Taken in 1913 at Mount Talipao, Mindanao. 6. Steel blade, "pirah" acutely pointed and convexly curved; provided with sharp downward curve near handle similar to the Malayan parang-latok; hardwood handle equipped with symbolic recurved horns and spike. Cebu, Visayan Islands. 7. Concavo-convex grooved steel blade; brass-shod handle and guard spike. Bagobo, southern Mindanao. 8. Kampilan-bolo type; chain ornament on hardwood pommel. Bagobo, southeastern Mindanao. 9. Grotesque totemic or wyang carving on wood handle; circular guard of wood; old type of Malay weapon. Panay, Visayan Islands. 10. Pirah. Cutting edge of blade has sweeping convex curve; heavy, concave blade black; truncated slope at point; handle fashioned of carabao horn and provided with long extension arm support. Moro, Basilan Island.

Plate 13

Hand weapons for cutting, piercing, and stabbing: Knives and daggers. No. 1. Dagger; triangular sectioned, curved, and pointed blade; single cutting edge; carved wood handle. Quinapundar, Samar Island. 2. Dagger "balarao"; hastate shape double-edged blade; handle provided with a peculiar finger-fitting grip consisting of extended tang and two horns; silver ferrule at center. Chief defense weapon of the Mandayan, southeastern Mindanao. 3. Woman's knife. Blade curved, designed for striking a slanting blow. Bagobo, southeastern Mindanao. 4. Plain dirk-dagger having curved blade, ferruled wooden handle, and circular guard. Moro, Mindanao. 5. Serpentine Malay dagger; grotesque dugong ivory carving on hilt. Collected by the United States exploring expedition, 1838–1842, under Admiral Wilkes. 6. Malay dagger; curved wooden pistol shape hilt; characteristic serpentine figure carving; straight-edged blade. Wilkes exploring expedition. 7. Serpentine kris-dagger; plain horn handle; engraved circular silver guard and ferrule. Moro, Mindanao. 8. Malay dagger; laminated blade; figured and carved handle of wood. Dyak, Pasir River, southeast Borneo. 9. Punal de kris; blade chased on surface section near handle; wood handle set in socketed brass ferrule. Moro, Mindanao. 10. Dagger; curved, double-edged blade; curved plain wood handle. Moro, Mindanao. 11. Dagger having saberlike blade; metal guard provided with volute tips; carved wood handle; blade chased and inlaid with soft metal at back. Moro, Jolo. 12. Dagger; serpentine blade; metal cross guard; spiral fluted grip of Camagon wood. 13. "Insurrecto" sword-dagger chased blade, pointed and double edged; cross guard; horn handle inlaid with shell mosaic; symbolically figured pommel.

PLATE 14

Types of wavy and straight-edged krisses. Moro, Mindanao, and Sulu Archipelago. No. 1. Old type of serpentine grooved blade provided with ornamental guard piece and sword breaker fastened with single stirrup; round wooden grip covered with bands of braided rattan. Moro, Mindanao. 2. Datto's kris, of recent production; blade inlaid with sinuous, dragonlike pattern in yellow metal; grip of wood. Lake Lanao, Moro, Mindanao. 3. Serpentine blade inlaid with figured patterns in yellow brass; improvised handle of wood. Moro, Mindanao. 4. Long, tapering serpentine blade; curved guard of silver; elaborately carved horn handle. Kris type showing Spanish influence. 5. Slightly sinuous steel blade; handle wrapped with braided waxed cord on grip section; carved pommel of sea cow ivory; plain old-style wood scabbard. Moro. 6. Straight-edged, slightly curved blade; handle covered with braided cord bands which also serve to fasten spiked stirrup extension for fastening guard and handle to blade. Moro. 7. Serpentine blade; hardwood handle overlaid with banded sheet silver and braided silver cord; crutch-shaped pommel of solid silver. Jolo Island. 8. Serpentine blade; grooved and inlaid with gold metal; single stirrup; wood handle banded with silver and wrapped with silver braid; carved cockatoo-shape ivory pommel. Admiral Wilkes exploring expedition, 1838–1842. 9. Straight-edged blade, etched and inlaid with copper; wrapped plain flat wood handle. 10. Very old type of grooved flame-shaped blade; symbolically carved ivory figurine on pommel; three-sectioned wood scabbard. Collected by the expedition under Capt. J. J. Pershing, 1903. Lake Lanao, Mindanao.

PLATE 15

Plumed helmets of brass; coats of chain mail provided with plates of brass and horn. Moro, Mindanao, and Jolo Islands. Nos. 1–2. Plumed, crested, and figured brass helmets; Moro manufacture, but modeled after design of fifteenth century Spanish burganet. Jolo Island. 3. Cuirass of chain armor and brass plates; chain links taken from old Spanish armor; brass plates of Moro Manufacture. Moro, Mindanao. 4. Cuirass of chain armor; plates of carabao horn highly polished and overlaid with ornamental figures in silver. Moro manufacture, Mindanao.

PLATE 16

Negrito man drawing bow, showing method of arrow release. (Two cuts.) Pampanga Province, Luzon.

PLATE 17

Negrito man drawing bow, showing types of simple iron arrow points (above) and of composite harpoon arrow types (below).

PLATE 18

Igorot men carrying characteristic weapons, including pronged shields, spears, and head axes. Bontok, north central Luzon.

PLATE 19

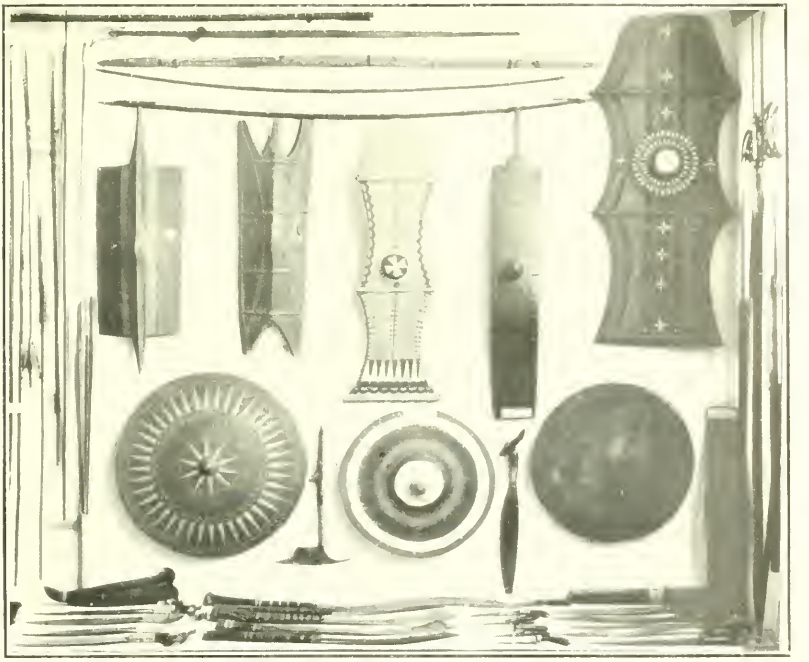
Tinggian hunters, showing type of hardwood bow together with arrows provided with bamboo points and spurred foreshaft. Abra, Benguet Province, north Luzon.

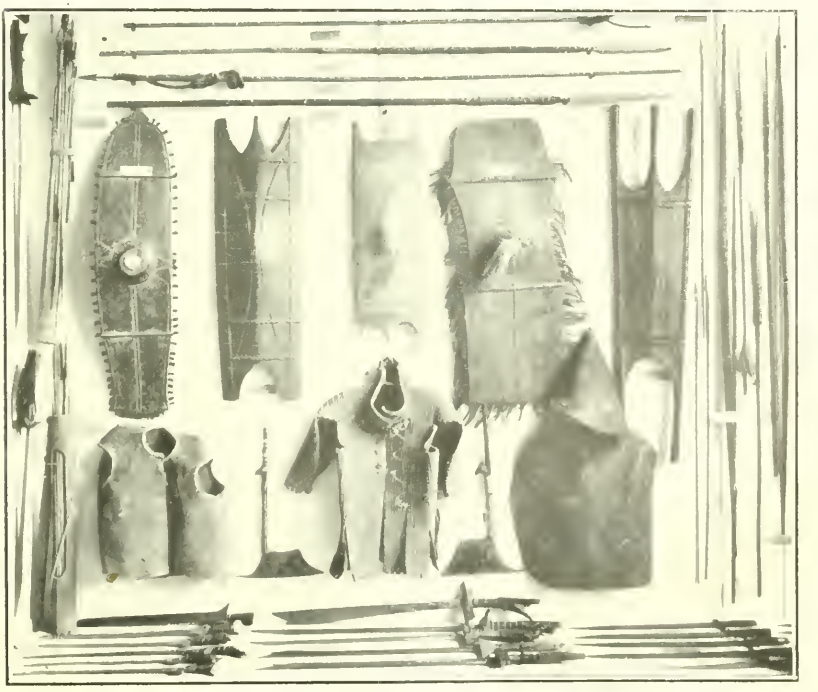
PLATE 20

Guingas man garbed in maroon jacket. Young Bagobo warriors provided with their characteristic side arms. Davao Province, southeastern Mindanao.

PLATE 21.

Bagobo warriors in full dress and completely equipped with weapons of their own manufacture. Davao Province, Mindanao.

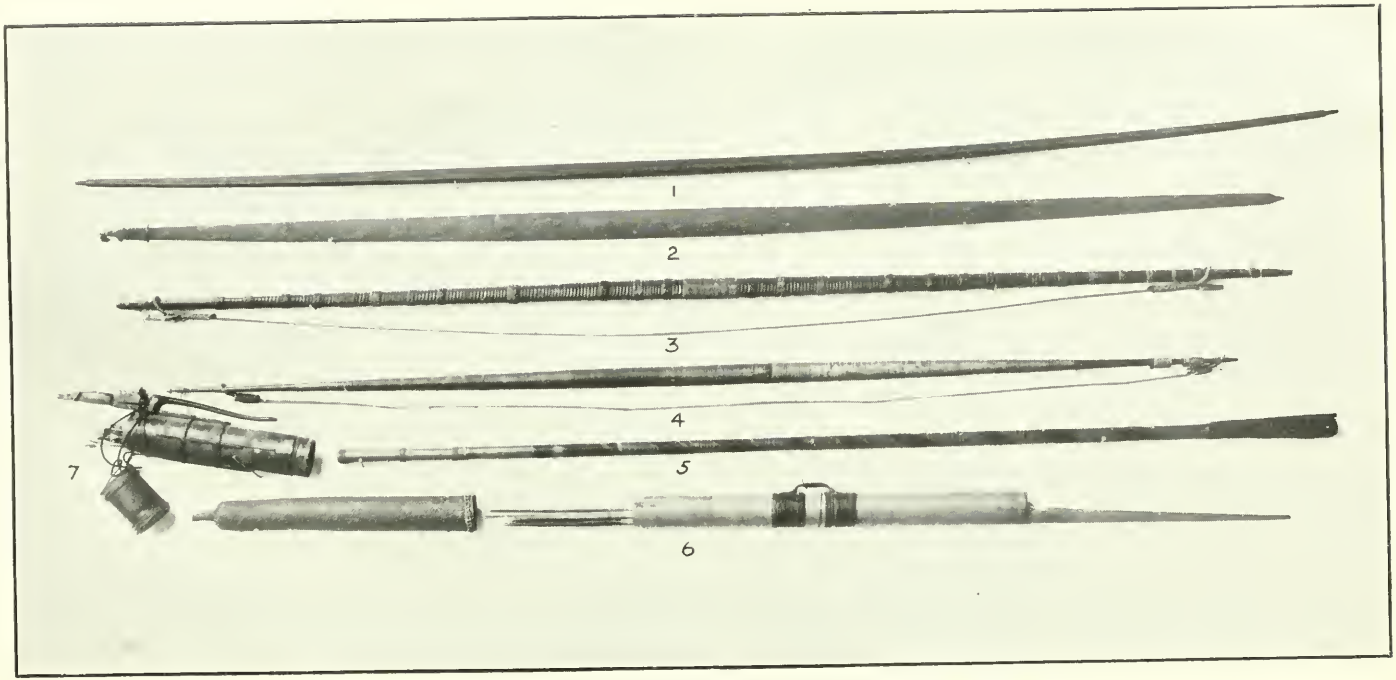




PHILIPPINE WEAPONS OF OFFENSE AND DEFENSE

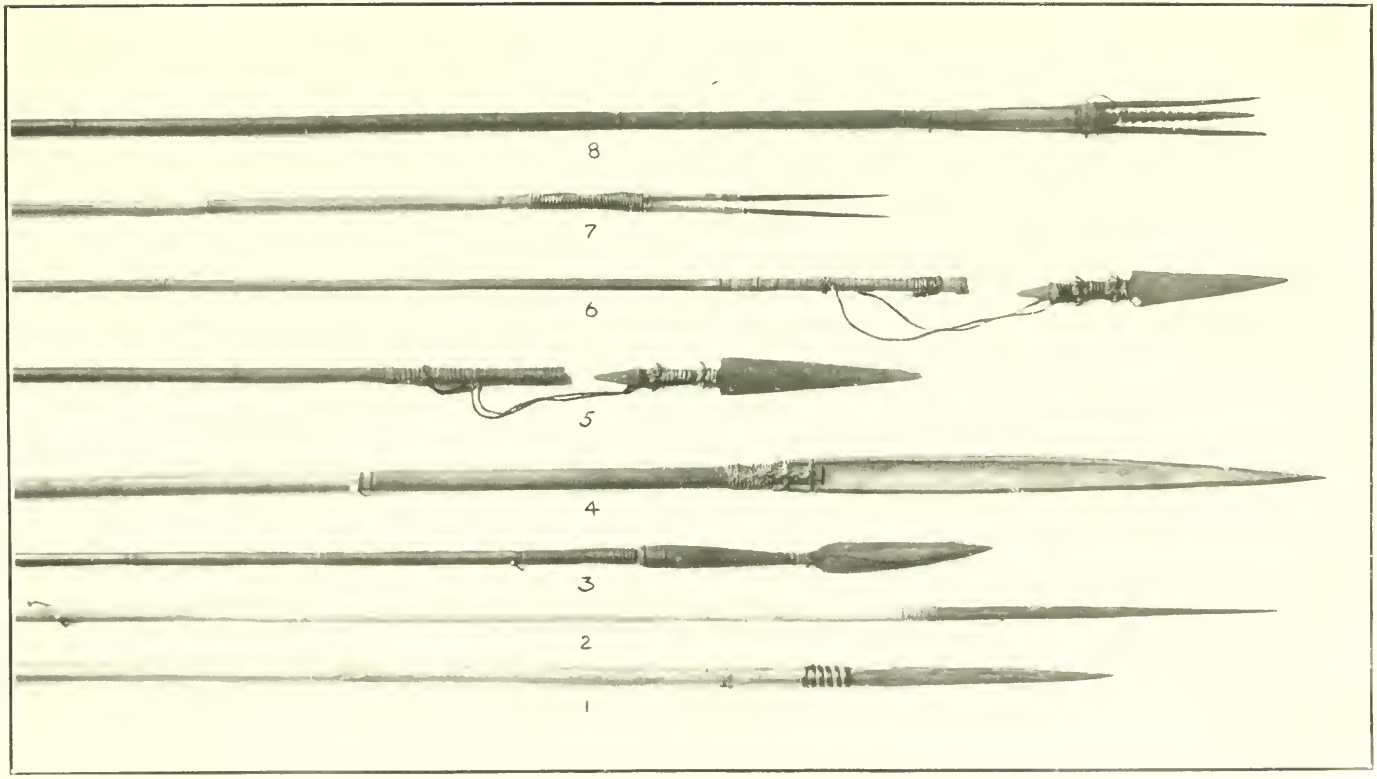
FOR EXPLANATION OF PLATE SEE PAGE 8

3021—26——9



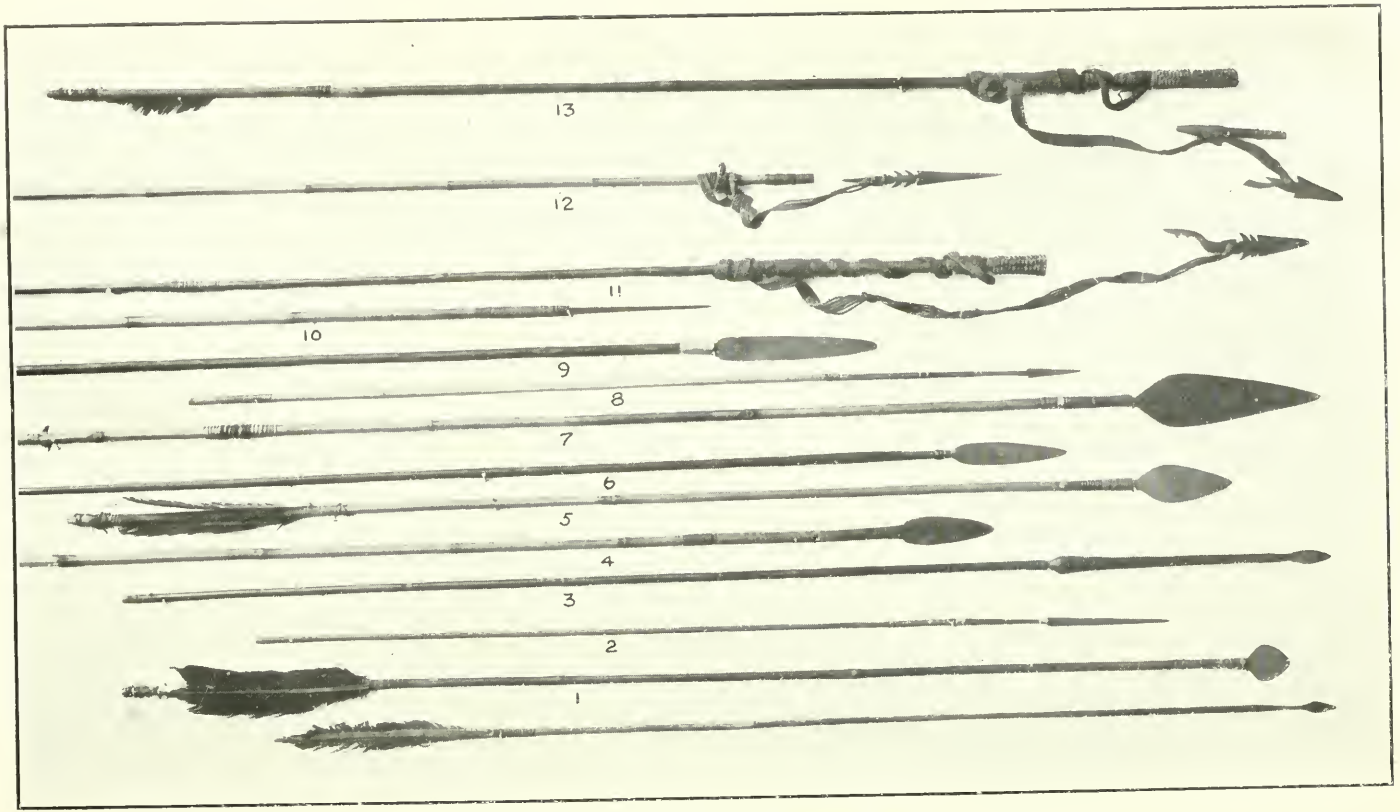
BLOWGUNS, BOWS, ARROWS AND DARTS, QUIVER AND DART CASE

FOR EXPLANATION OF PLATE SEE PAGE 30



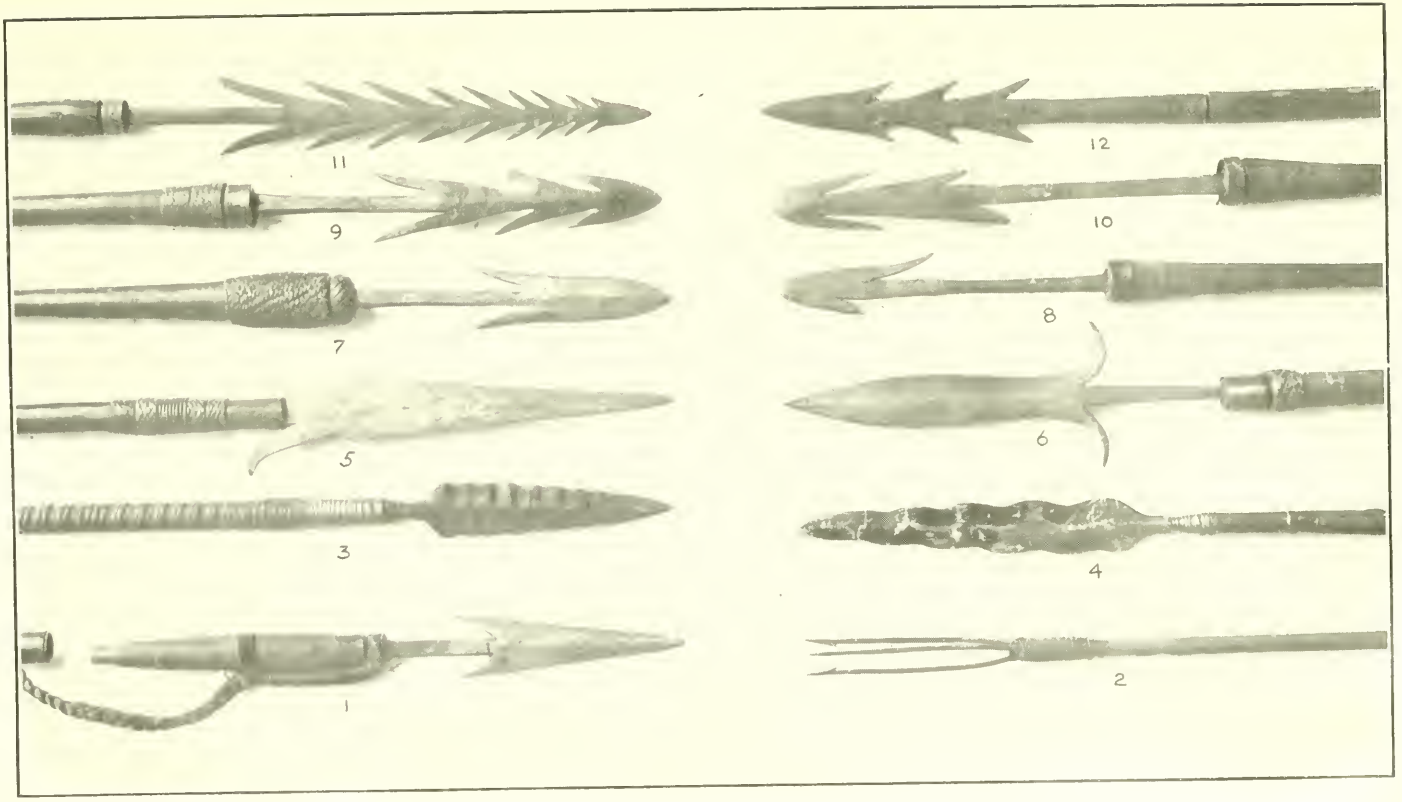
ARROWS OF PALMWOOD AND BAMBOO

FOR EXPLANATION OF PLATE SEE PAGE 30



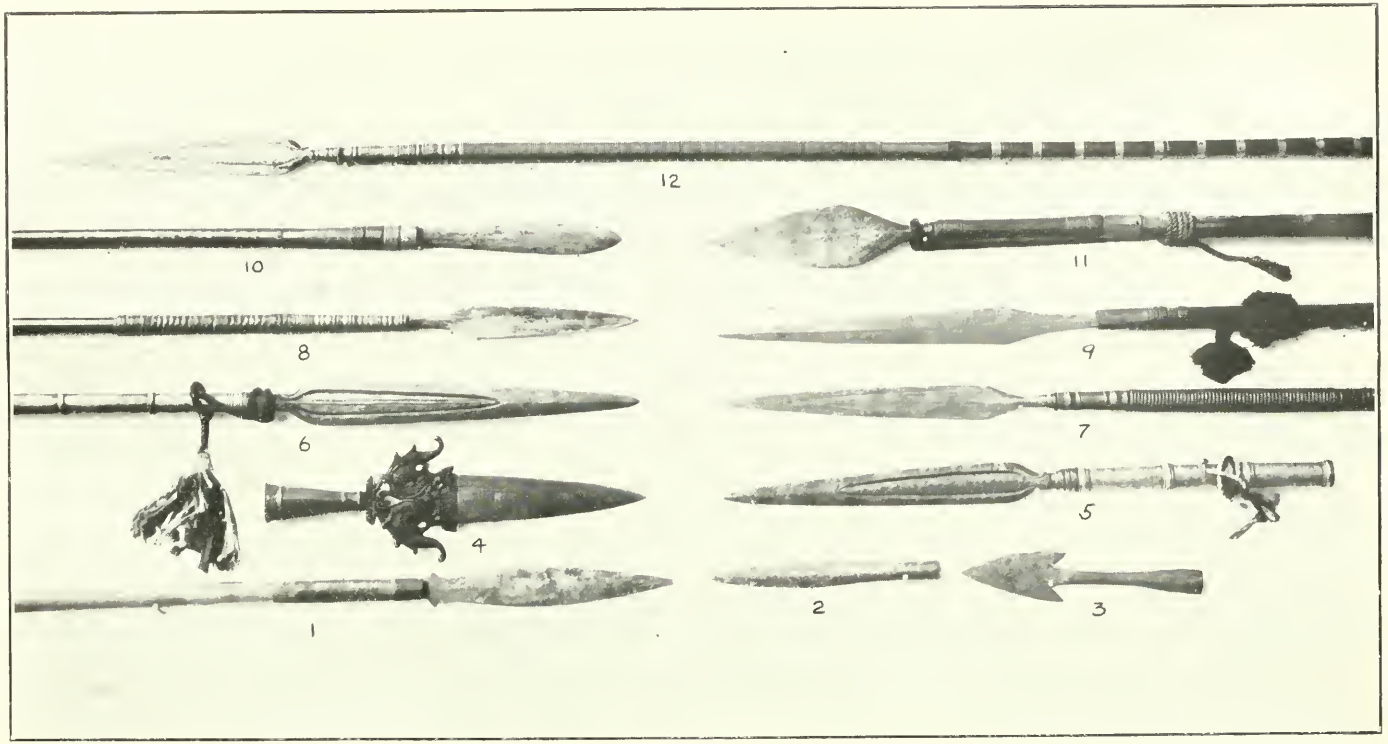
METALLIC HARPOON AND ARROWHEADS

FOR EXPLANATION OF PLATE SEE PAGE 30



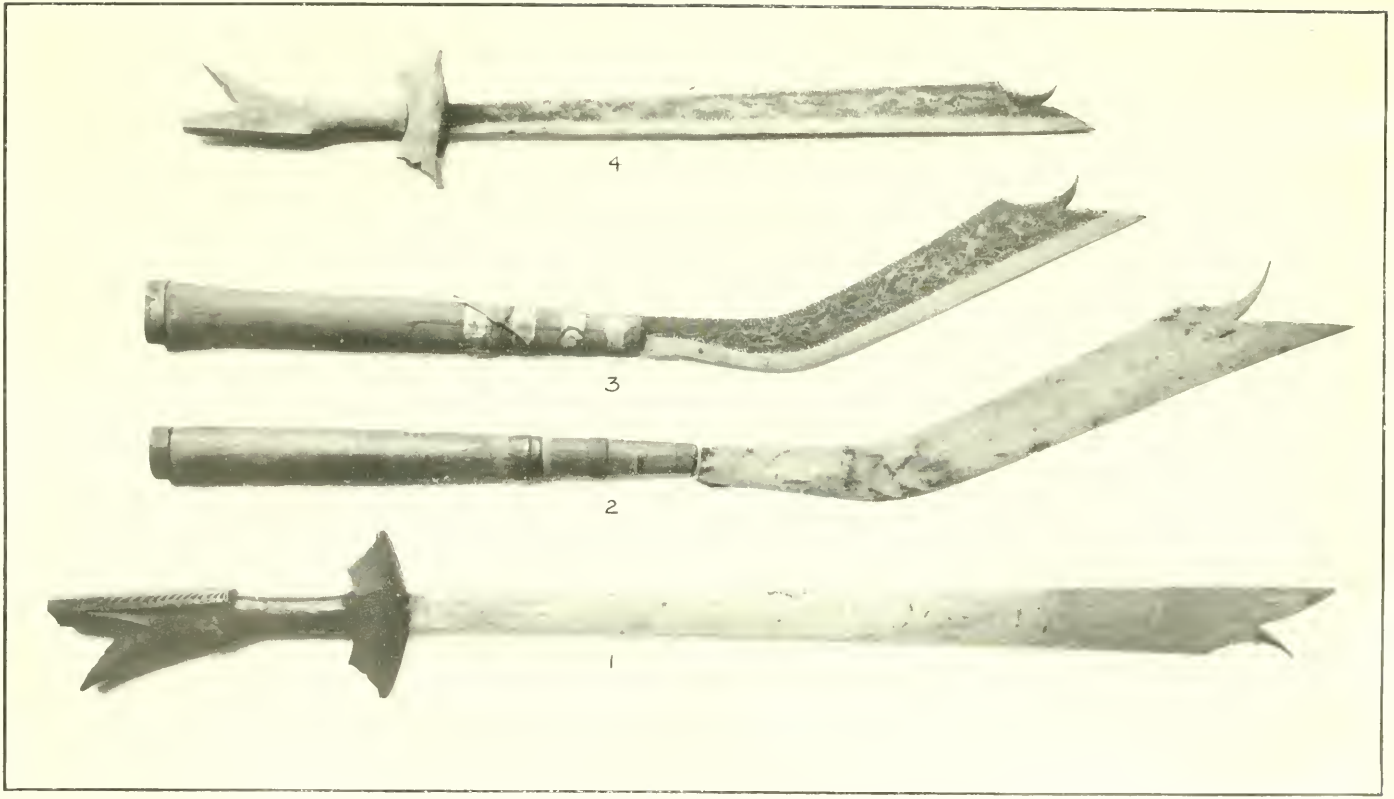
CEREMONIAL, WAR, FISHING, AND HUNTING SPEARS

FOR EXPLANATION OF PLATE SEE PAGE 49



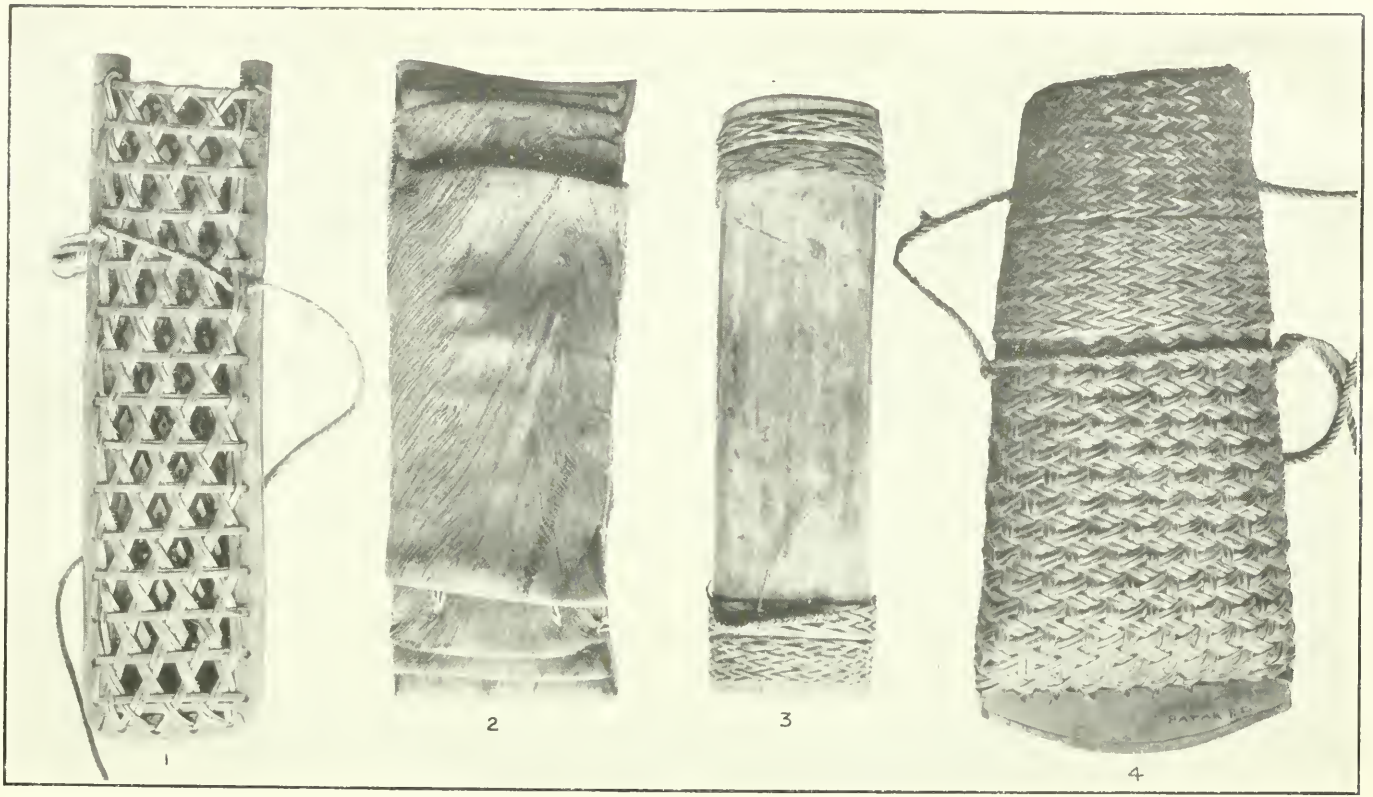
ORNAMENTED CEREMONIAL AND WAR SPEARS

FOR EXPLANATION OF PLATE SEE PAGE 49



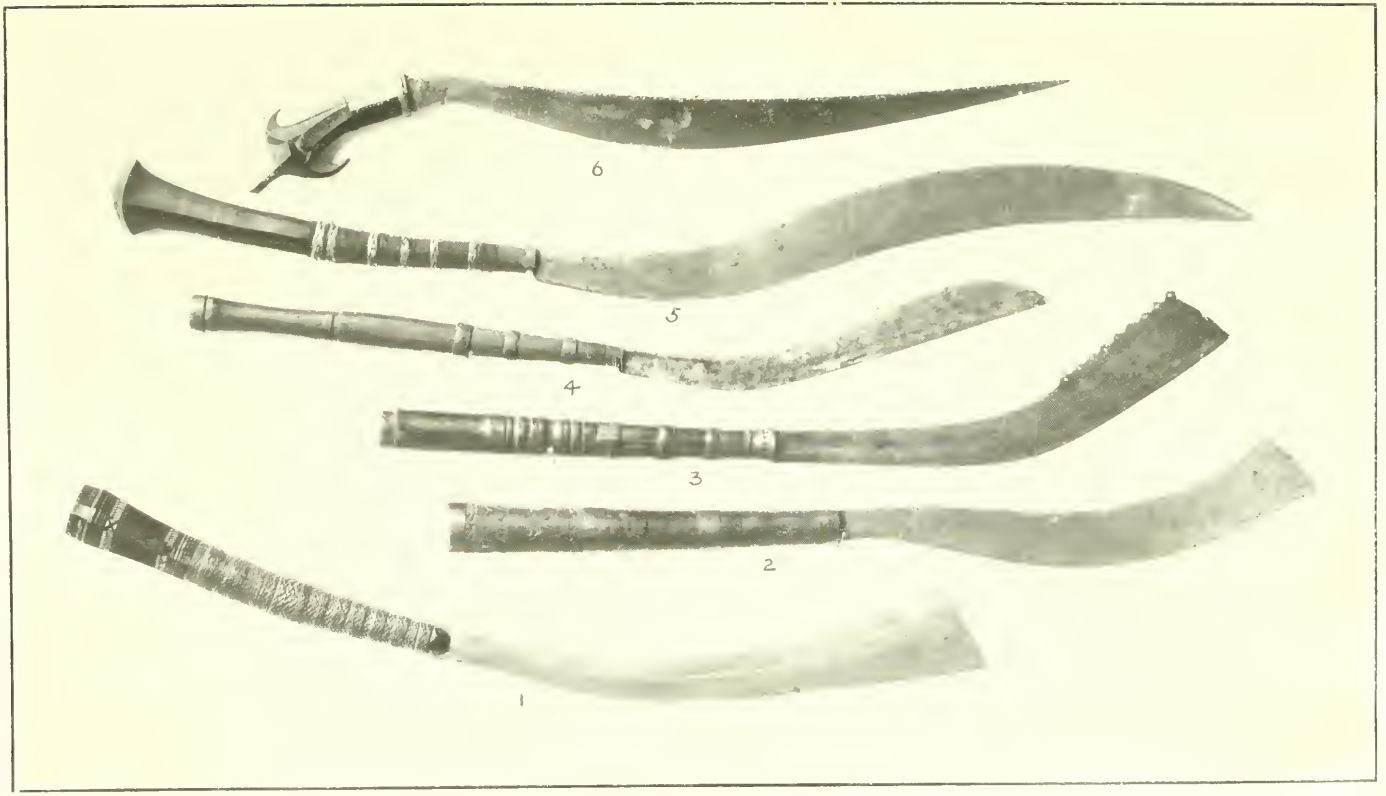
KAMPILAN AND TALIBONG FOR SLASHING AND CHOPPING

FOR EXPLANATION OF PLATE SEE PAGE 62



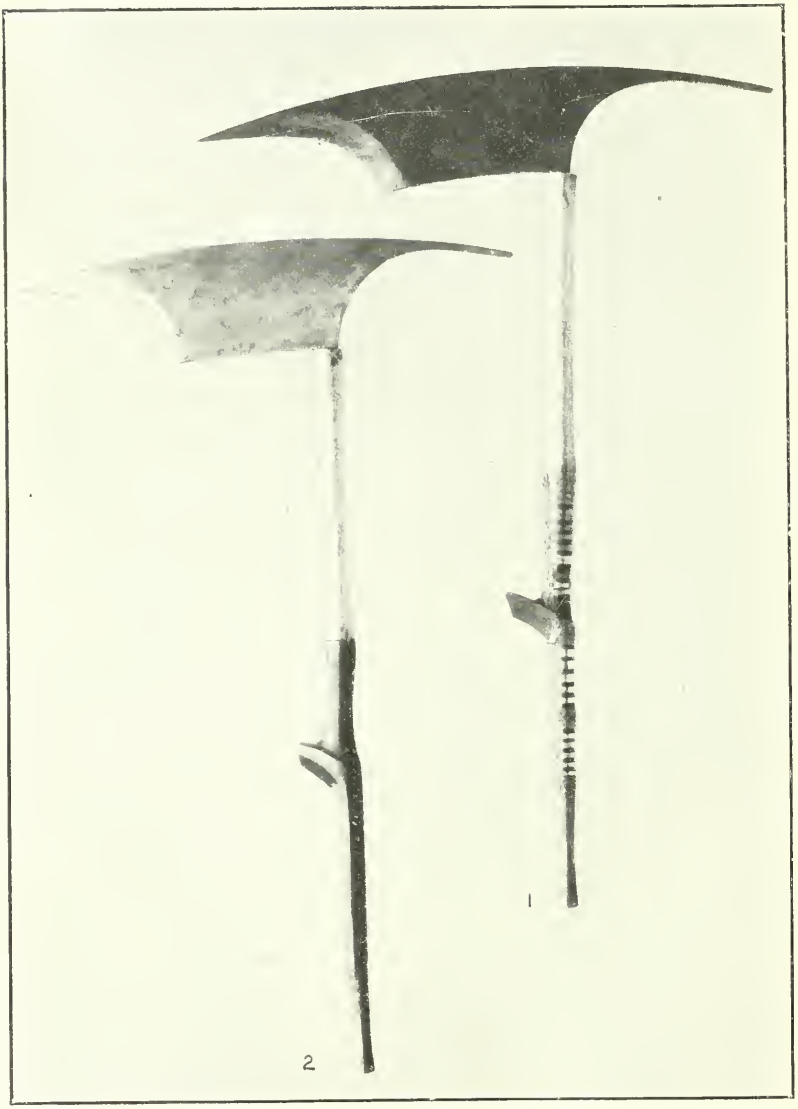
BASKETRY BOLO CASES AND KNIFE SHEATHS

FOR EXPLANATION OF PLATE SEE PAGE 62



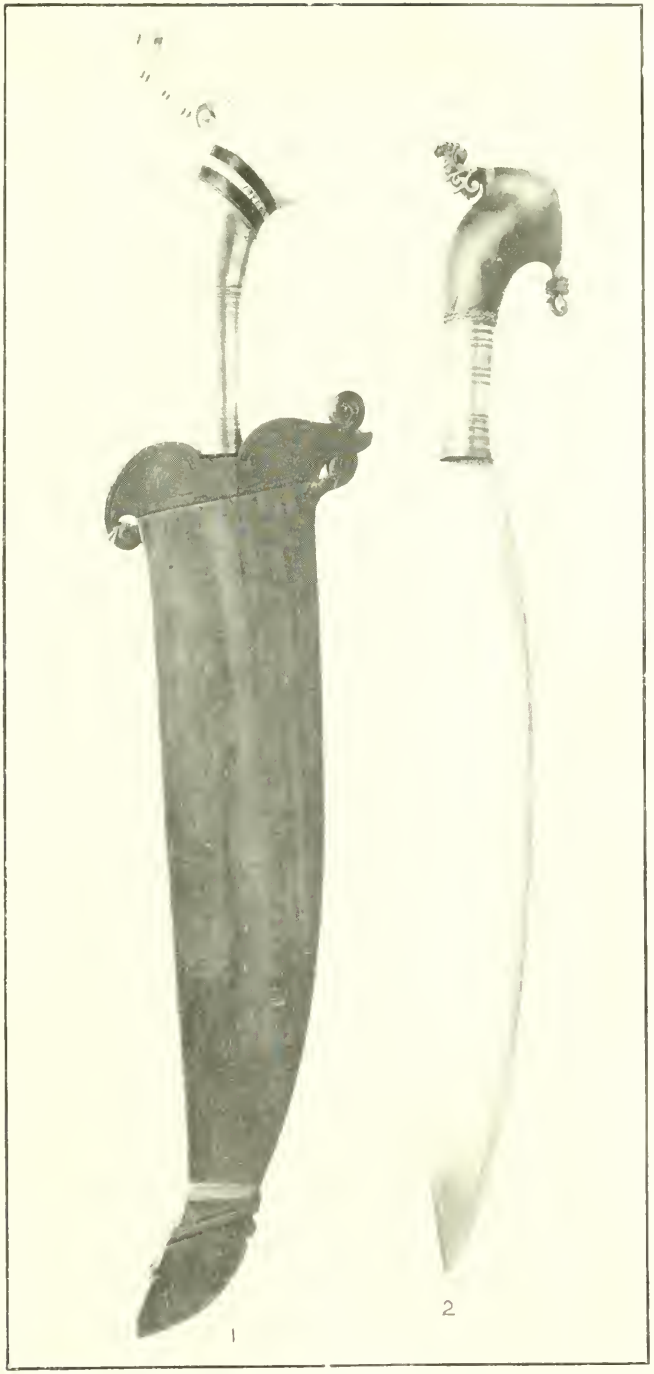
TWO-HANDED CHOPPING AND CUTTING PARANGS

FOR EXPLANATION OF PLATE SEE PAGE 62



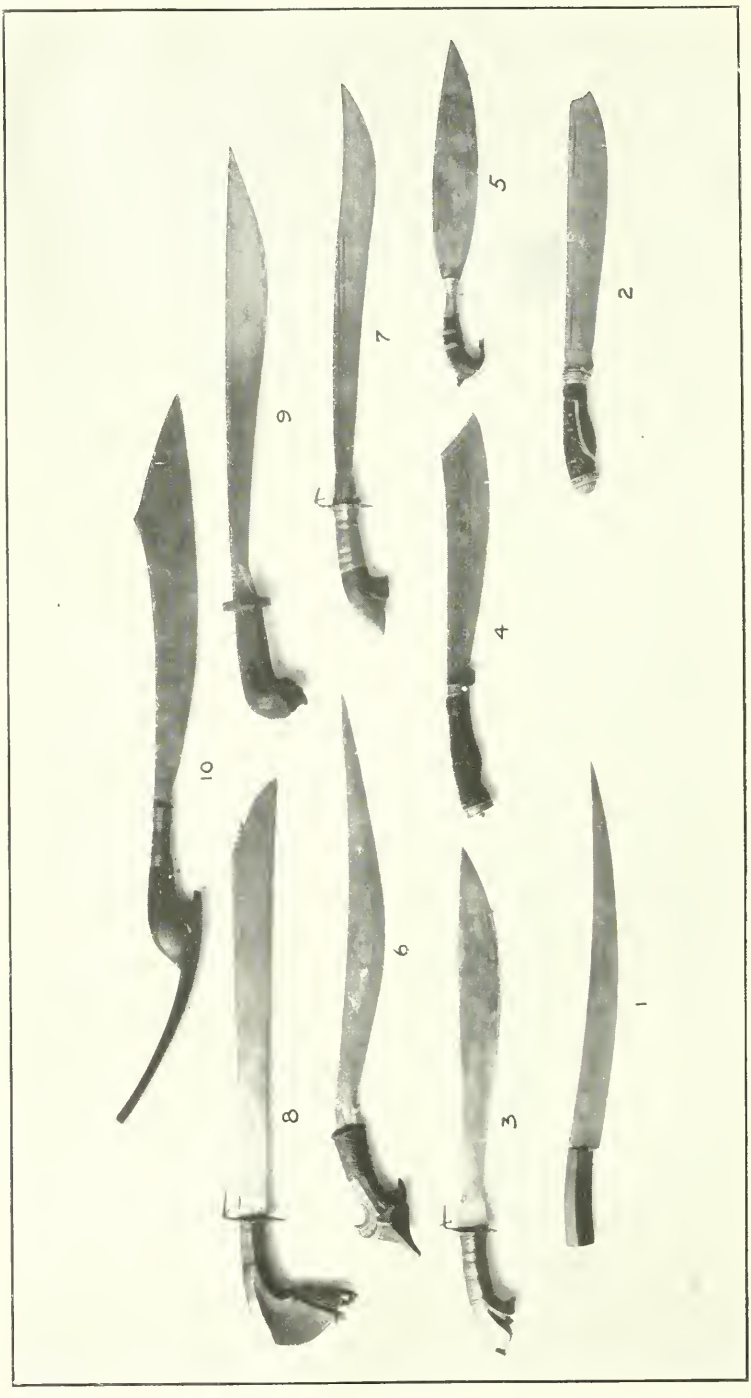
MALAYAN AND INDONESIAN HEAD AXES

FOR EXPLANATION OF PLATE SEE PAGE 62



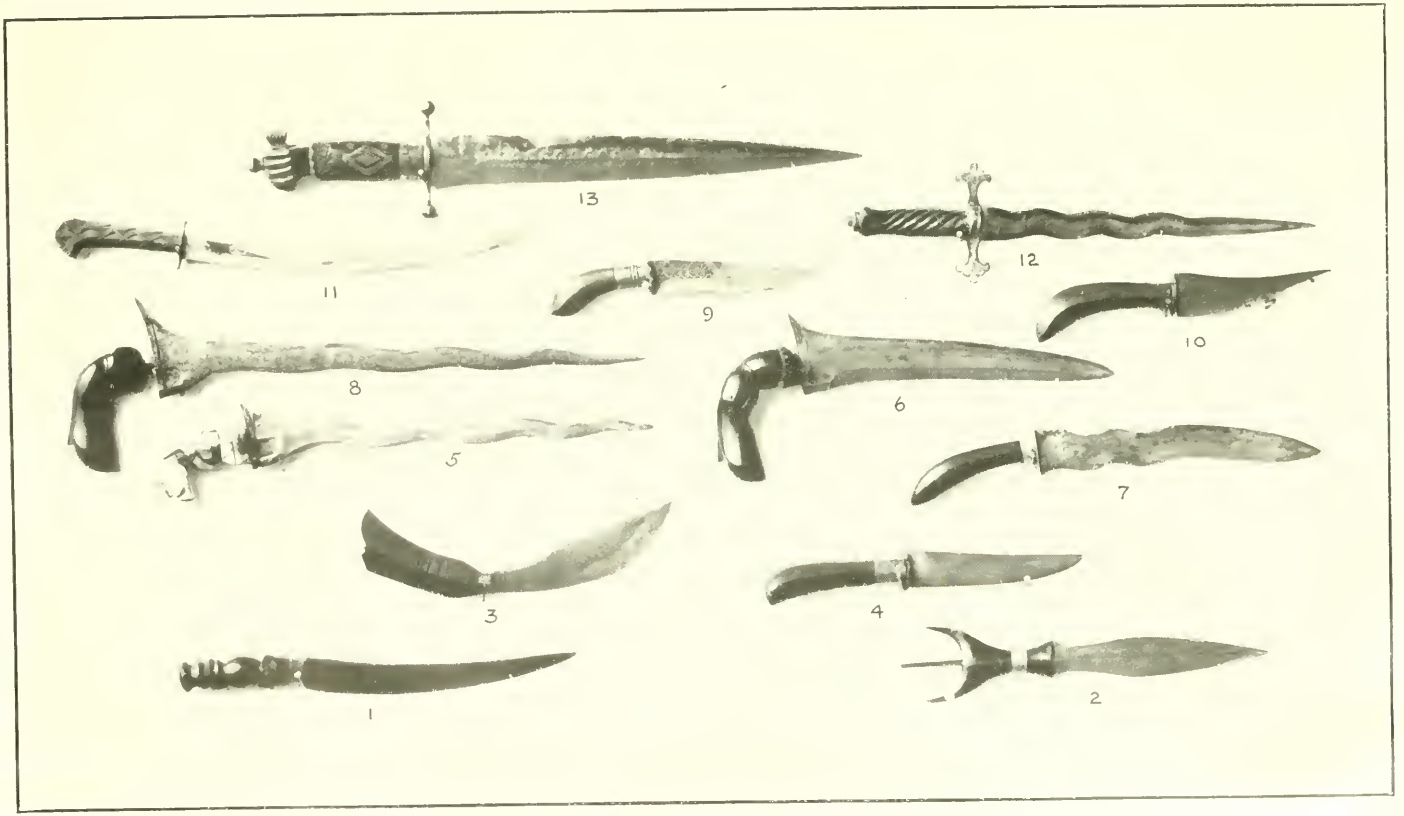
SPECIALIZED ORNAMENTAL BARONG

FOR EXPLANATION OF PLATE SEE PAGE 62



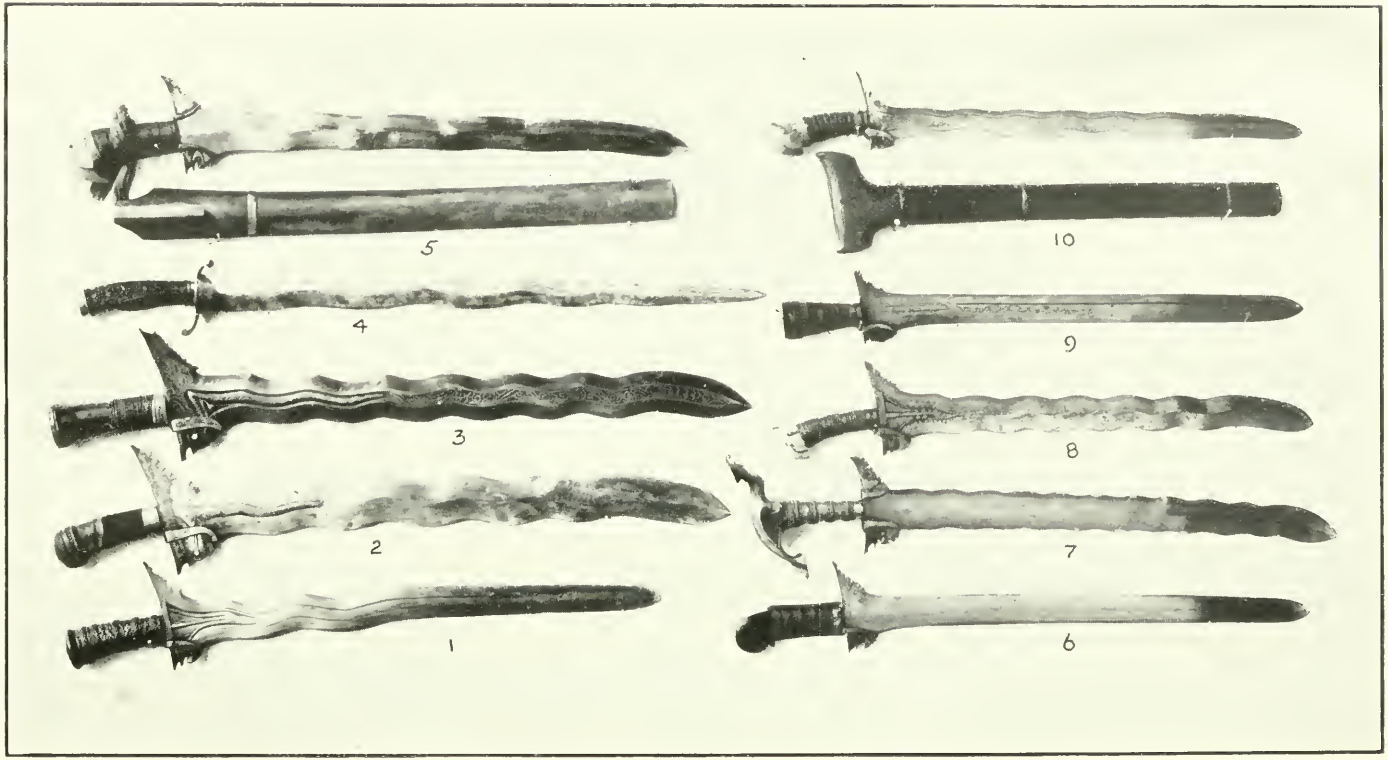
COMBINATION PIERCING AND CHOPPING BOLOS

FOR EXPLANATION OF PLATE SEE PAGE 62



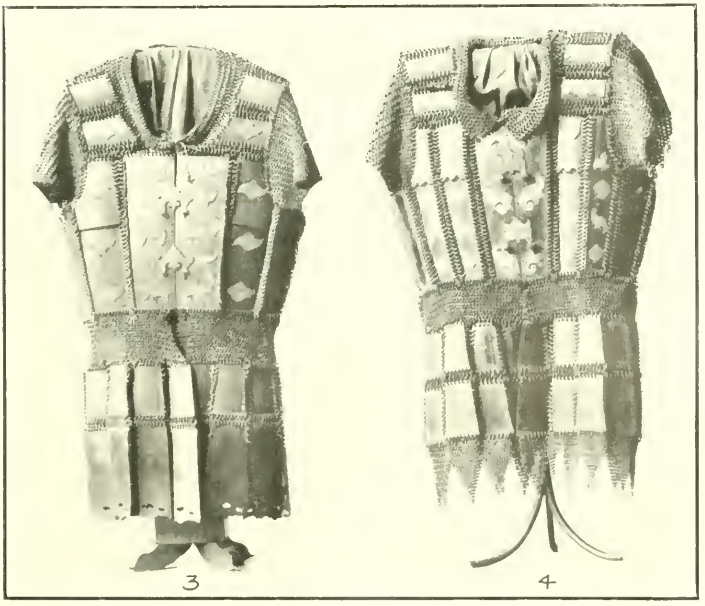
KNIVES AND DAGGERS FOR CUTTING, PIERCING, AND STABBING

FOR EXPLANATION OF PLATE SEE PAGE 62



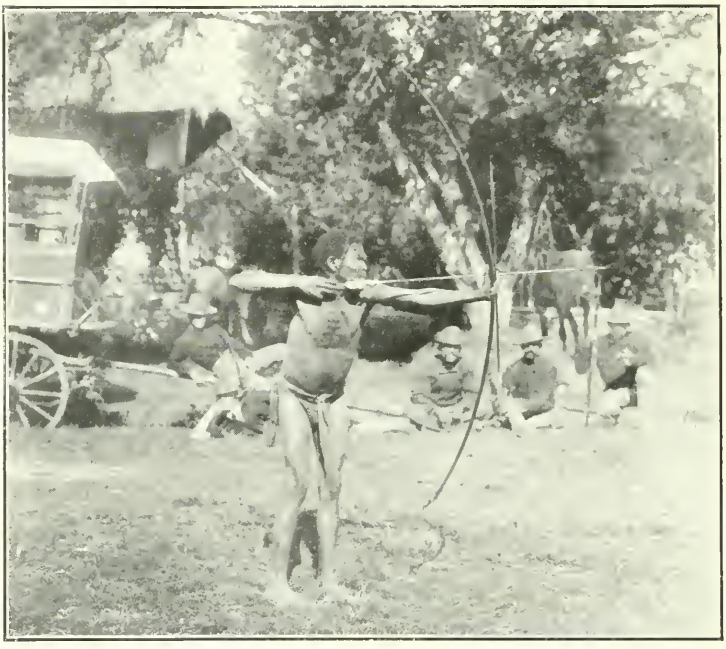
TYPES OF WAVY AND STRAIGHT-EDGED KRISSES

FOR EXPLANATION OF PLATE SEE PAGE 62



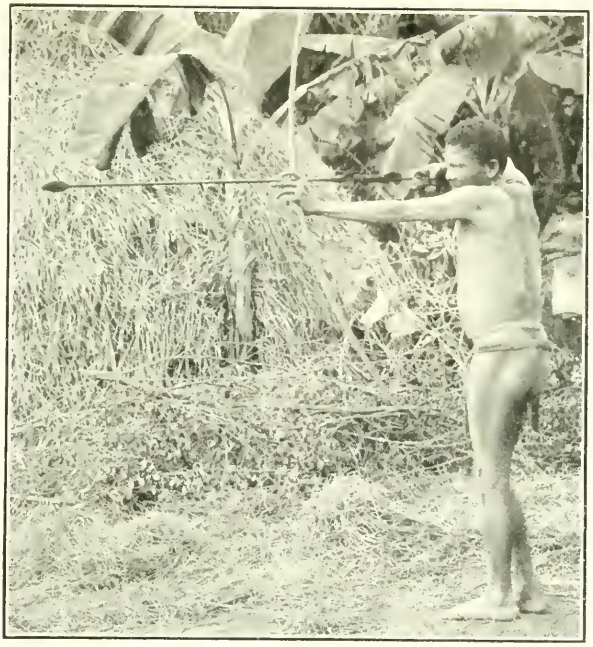
BRASS HELMETS (1, 2) AND CHAIN MAIL COATS (3, 4)

FOR EXPLANATION OF PLATE SEE PAGE 96



DRAWING BOW, SHOWING METHOD OF ARROW RELEASE

FOR EXPLANATION OF PLATE SEE PAGE 30



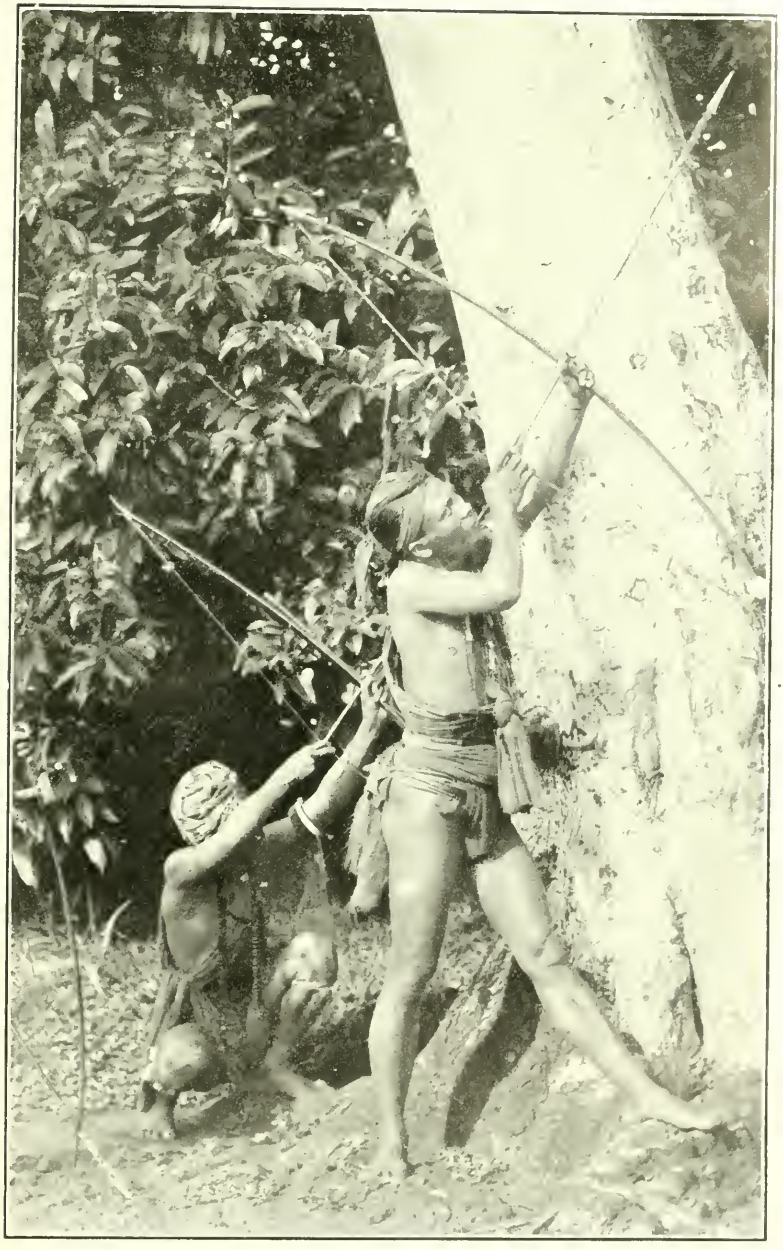
NEGRITO METHOD OF DRAWING BOW

FOR EXPLANATION OF PLATE SEE PAGE 30

3021—26 10

CHARACTERISTIC WEAPONS OF THE IGOROT

FOR EXPLANATION OF PLATE SEE PAGE 49



TINGGIAN HUNTERS OF NORTHERN LUZON

FOR EXPLANATION OF PLATE SEE PAGE 30

BAGOBO WARRIORS OF SOUTHEASTERN MINDANAO

FOR EXPLANATION OF PLATE SEE PAGE 62

BAGOBOS WITH COMPLETE WAR EQUIPMENT

FOR EXPLANATION OF PLATE SEE PAGE 49

INDEX

	Page
Abaca cord fiber, cuirass of	11, 13, 108
Abbott W. L.	34, 35, 83
Adaptability of Philippine weapons to cutting and slashing	10
Aeta	20
African Negrito arrow	30
throwing irons	9
trumbasses	9
Aguinaldo, Emilio	27
Agusan River valley	81
Ahern, G. P.	3, 81
Aino, use of crossbow trap by	31
Air bag draft device	17
Ali, Datto	27
Alphabet, Filipino	23
American Museum of Natural History	3
Andaman Islands, arrows of	44
Angat Mountains, iron mining in	14
Animal products, use of	13, 31
Anitos	4, 51
barbed spear against	51
head hunting guard against	89
Anterior curve of kris handle	79
Antiaris poison	31
Antique province, mountaineers of	6
Apiao, use of path splinters by	56
shields of	94
Appliqué ornamental designs	1
Arab, missionaries of western culture	22
settlements	22
Arabesque designs	79, 84
Arabia, brass cannon of	25
gunpowder from	25
Arabic influence	7
Arbalest, function of	9
Archeology of the Philippines	10, 25
Archers, Filipino	30
Aringay River	56
Armor, body, of chain mail	11, 106
of cord	2
of horn	2
of leather	11
Malayan types of	11
of plate brass	11
of primitive Filipino	27
of Spanish	11
of woven fiber	11, 108
Army Medical Museum	6
Arrows	5
characteristics of	30
of primitive Filipino	27
poisons used on	33, 34
release of	33
variations in	32
Artiele	30
Asiatic migrations to Philippines	19
Assam, fire bellows of	16
crossbow from	34
Ax, origin of	8
Axis of serpentine kris	64
Ayuntamiento	109
Bacon, Raymond F.	34
Bagnen, shield from	98
Bagobo, arrow types of	4, 39, 42
axes of	3
basketry bolo case	73
bolos of	4, 71
bolo scabbards	4
bows of	1
bow cord	37
braided ferrules	4
brass work	4, 5
carved textile patterns	4, 106
circular shield of	103
culture borrowings	7
daggers	3
decorative shield designs	97
iron industry of	29
knives	3
metal casting by	14
quivers	4
shields	3, 4
spears	3, 4, 54, 55
swords	3
talibong	94
tufted darts	60
Balanga, Bataan Province	28
Balangingi, island of	27
Balarao	64, 66, 84
Balimbing	3, 104
Balitil	56
Baliwang, smithy at	15
Bamboo, basketry traps of	12
bows	2
cannon	12, 28
silicious rind of	13
spear blade of	2
split bow cord of	36
uses of	10, 12
varieties	12
Banawi, shield from	98
Barbed spear	52
Barbs, bilateral arrow	30
Bark, twisted, bow cord of	35
Barong	5, 63, 66
Barrows, David P.	23, 112
Barr, David	6
Barton, R. F.	112

	Page
Basketry bolo case of woven rattan	72, 85
knife case	74
scabbard	73
traps of bamboo	12
Batak, basketry bolo cases of	73
blowguns of	7, 11, 58–60
bows of	3, 35
human sacrifices by	88
hybrid racial stock	6, 7, 20
weapons of	6
Bates, Caroline E	4, 78
Battak, of Sumatra	20
Bayonet	9
Beeswax, black	86
seizing of	37
Beheading sword	5, 63, 93
Bellows, cylindrical, of bamboo	14, 15
extent of native fire	18
Bell, James W	2, 42, 48, 71, 103, 108
Benguet-Igorot	89
Betel-nut palm	12
Beyer, H. Otley	112
Bicag tree, poison from	34
Bikol, armor of	108
arrows of	41, 42
shields of	103
use of bows by	31, 35
Blade types	11
Blair, E. H. and J. A	112
Blood money	89, 90
revenge	90
Bowgun, distribution of	57, 58
function of	57
method of construction of	58, 59
of Borneo	58
of the Iroquois	58
of Japan	58
of North America	58
of South America	58
parts of	60
poison, for darts for	33, 34
single tube	11
type specimens of	58, 59
Blowtube, function of	9
Blumentritt, F	112
Body armor, distribution of	106
materials used for	106
origin of	106
types of	7
Bohol, island of	109
Bolo, social significance of	65, 66
type specimens of	70
Bone, use of in weapon handles	13
Bontok-Igorot, metal casting by	11
shields of	96, 98
use of bow by	31
Bontok, head hunting by	90
Borneo	83
blowgun of	58
brass helmets of	107
center of sword manufacture	15
commerce of	26
influence of, on Philippine weapon types	7
introduction of iron working from	14
Boss, of shield	97, 100

	Page
Bow, antiquity of Malaysian	30
characteristics of	30
classification of	9
curvature	36
development of the	9, 34
English long	30
function of	9
materials	32
methods of holding	32
ornamental wrappings	13, 31
parts	32, 34
stave	30–34
type specimens of	31–35, 56
Bows and arrows for hunting	32
target and war	32
Bow gun or arbalest	10
Braided rattan	5
Braid forms	63
Braminism	23
Brass, antiquity of, in Malaysia	16
cannon	4, 26, 27
casting of	4
composition of	16
ferrules	2, 4
firearms	11
helmets of	2, 109
ornamental use of	11, 14
processes of working	16
British-Indian army	19
Bronze, composition of	16
firearms of	11
Brooke, James	27
Brough, Bennett H	112
Buddhism	23
Buffalo, N. Y	28
Bugin	24
Bukidnon	20
Bulacan Province, implements from	2
iron mining in	14
Bulalacao	34
Burial of human heads	89
Buri palm, uses of	12
Burma, crossbow from	34
religions of	23
Burmese Dah	68
Bushmen arrow type	44
Buti, Archie	6
Cagayan Province, bowmen from	30
Cainta, native fort at	26
Caltrap	11, 57
Camagon	13
Camarines Province	28
war club from	47
Cannon, native, of bamboo	28
of brass and bronze	28
casting of	26
Capiz Province, mountaineers of	6
Carabao, decorative design on horn of	13
hide, use of, in shields	103
horn, use of, for handles	13
plate armor of horn of	109
Careri, John Francis	31
Carib, rounded bow stave of	35
Carr, Wilbur J	6
Carriage, wooden gun	28

Page

Carving, as a process of metal working 15
Casting, of brass cannon 26
of iron unknown in Africa 17
process 15
Cavendish 27
Cebu, island of, bolo types from 70
weapons from 5
Celebes, island of 24
influence on Philippine weapons 7
shield from 97
Census of the Philippine Islands 112
Centennial Exposition 61
Ceremonialism in head hunting 89
Ceylon, island of, primitive methods of iron production in 18
Chain armor 106
Chao Ju-kua 25
Chapman, W. Huse 6, 49
Characteristics of weapons of Philippine Islands 11
Charcoal fire, use of in metal working 14
Charleston Exposition 2
Chasing, a metal working process 15
Chevaux de Frise 11, 55
China, antiquity of iron age in 18
source of Filipino metal crafts 16
use of crossbow in 31
Chinese, an agricultural people 25
arrow styles 3
artisans 24
blade types 80
double sword 81
iron spear 4
sword decorative design 81
trade articles 16
traders 16, 24, 25
Chopping sword 94, 95
Christianized tribes, metal implements of 3
weapons of 3
Christie, E. B. 112
Cire perdue process 16
Civilization, influence of foreign 7, 19
native Filipino 7
types of foreign culture influence 7
Classification of weapons 8, 9
of defense and offense 10
of edged, pointed, and striking types 9
of woods employed in 13
Claveria, Narciso 27
Claymore, classification of 9
Clemens, Joseph 4, 56, 74, 95, 105
Clubs, knobbed 8, 11, 16
Clubbed shield 47, 48
stick 8
weapons 15
Coconut oil, use of 32
palm, use of 12
Coir, use of 12, 13
Cole, F. C. 112
Cole, Mrs. M. C 88
Coleman, Richard 82
Collection of Philippine weapons 1–6
Commerce, in iron products 11
in weapons 26
Composite arrow of Negrito 43, 44
Compound arrow 12

Page

Compressed air, use of, in blowguns 57, 59
Constabulary, Philippine Islands 89, 90
Copper, inlay designs in 8
ornamental use of 11
Corbin, H. C. 6
Corbin, Mrs. H. C 6
Cord armor 108
Corselet of brass 106
of horn 106
of wood 106
Cota 27
Cotobato River valley, circular shield from 101
tribes of 97
Cotta 27
Counting marks on blades 87, 89, 90
Courts, Mrs. James F 4, 37, 41, 53, 54, 87
Crossbow 4, 34
former prevalence of 11
types of 35
Crucible for gold reduction 10
Cuirass 3
of woven abaca cord 108
Culture influence, from Borneo 19
of Hindus 19
by Indo-Chinese 19
Islamic 19
by Japanese 19
by Javanese 19
by Spanish 19
Culture strata 20–22
Culture traditions influencing weapon types 16
Culverins 11
Cutting and chopping blades 2
Cut-and-thrust weapons 9
Daggers 2, 4, 63
Dah 68
Damascening process in metal working 15
Damascus steel blade 2
Daraga 88
Darrah, Thomas W 101
Darts, poisoned 33, 34
Das Mariñas, L. P 30
Davao Province 94
talibong from 94
weapon collection from 3
woman's knife from 94
Dean, Bashford 109, 112
Debts of honor 90
Decorated oblong shield 101
Defense weapons 96
Delhi, iron pillar at 18
Design, decorative, on handle 7, 84
Differentiation of weapon forms 8, 65
Digging sticks 8
Dolmens, burial 18
Double sword 81
Draft-producing devices 17
Drake, Francis 27
Driver, F. H 87
Dugong, use of, on handles 13, 72
Dulao dye 97
Dumanquilas Bay 16
Dwyer, Mrs. Thomas F 5
Dyaks, an Indonesian tribe 22, 24
as individual fighters 27
daggers of 83

Page

Embossed flutings 86
handles of silver 5
Moro weapons 15
Encomienda system 29
Environmental factors 32
Etching of dragon figures 2, 3
Ethnic contacts influencing weapon types 16
Ethnic stocks in the Philippines 19
Ethnic stratification 19
Ethnological survey of the Philippine Islands 15, 51
Eye of the wind 27
Fans, crossbow of 34
Feathering of arrow 33
by Kalinga 38
by Moro 33
by Negritos 38
Fergusson, Arthur R 53, 56, 86, 102, 105
Field Museum 65
Fiji, spears from 52
Filigree process in metal working 15
Firearms, use of 26
Flagellation rods 47, 49
Flat bows 31
Folding crossbow 35
Ford, John H 6, 37
Foreign influence on kris design 80
Foreshaft, bulbous, arrow 42
Funston, Fred 27
Gaboôns, use of crossbow 34
Galvey, G. 56
Gies, Anthony J 53, 61, 70
Godson, W. F. H 6, 36, 40, 43, 44
Goite, Martin de 24
Gold 16
ornamental use of 14
primitive trade in 16
Gongs, handle for 89
trade in 16, 25
Goo'na dagger 84
Grip, shield hand 100–102
Grooved bow stave 35
Grubbs, Robert B 2, 54, 82, 85, 95, 109, 111
Guard piece, centre guard for kris 64, 65
Gunpowder, Moro 26
Gunstock for crossbow 34
Guthe, Carl E 25
Hair, horse, use of 13
human, use of clipping of 13, 99
tufts 5
Hairy kampilan 13, 67, 74
Halberds, classification of 9
Spanish 3
Hammering, process in metal working 15
Hammond, E. H 6, 40, 45, 69
Hand, D. W 6
Handbook of Arms and Armor 109
Hand weapons, early scarcity of 9
specialization in 9, 32
Handles, ivory 11
types of 63
wood, decorated 11
Harkins, J. M 2, 6, 78, 94, 99
Harpoon arrow 44
spear 52
Harris, Jesse R 3, 62, 89, 99, 108
Hawkes, E. L 6, 42

Page

Head axes 3, 5, 67, 92
Head basket 65, 91
Head cover and shield 98, 104
Head hunting, ceremonial practice 7
religious rite of 89, 99
suppression of 29
type weapons 91
Headman's ax 95
Helmets 2, 106
of brass 11
of fiber 11
of hide and horn 11
of tin 11
Hides and skins, use of, in shields 11, 13, 103
Hilder, Frank F 2, 39, 61, 62, 69, 71, 77
Hill people 20
Hindu, blades 4, 5, 7
influence of in Malaysia 16, 106
penetration of 24
temples of 23
Historical culture contacts 21
History of Philippines, beginnings of 21
Hodge, E. R 6, 37, 41, 61
Horn, use of, on weapon handles 11
of water buffalo 91
Hose, C 24
Hough, Walter 17, 112
Huahulama, datto 107
Human sacrifice 88, 99
Ibalao, bow of 31
Ibaloi, songs of 76
Ibilao, use of path splinters by 56
shields of 97
Ifugao, industries of 89, 90
law 88
path splinters, use of by 56
shield of the 96
Igorot 20
head axes of 3, 92
pronged shield of 5
use of bows by 35
use of poison by 56
war spears of 2
Ilagan, Isabella Province, Negrito weapons from 3
Iligan, Mindanao 2, 110
Ilanan Moro 22
Ilocano, use of bow by 31
Iloilo Province, mountaineers of 6
Ilongotes, shields of the 97
Imperial Museum of Tokio 80
Implements used as weapons 8
India, abundance of iron ore in 18
center of distribution of fire bellows 18
influence on Filipino culture 23
lack of copper ore 18
source of metal crafts 16
weapons of 4
Indigo dye 102
Indonesian, culture survivals of 29
distribution of 21
ethnic stocks 19–20
helmet 106
iron culture of 7
Informe Sobre el Estado de las Islas Filipinas en 1842 56

Page

Inlaid serpentine kris 79
Inlay, of lime 97
  methods of 16
  of soft metal 14
  process of metal working 15
Insignia, use of weapons as 14
Institution of head hunting 87
Insurrection in the Philippines 1
Insurrecto armament 28
  dagger 84
  weapons 67
Introduction of metals, influence of 8
Ipil 13
Iron age 14, 17, 18
Iron arrow points 32
Iron culture of Malaysia 2, 8
Iron industry of northern pagan tribes 29
Iron ore smelting 17
Jamdhar 4
Japan, antiquity of iron age in 18
  blade types of 80
  early warfare in 25
  long swords of 9
  use of crossbow in 34
Java, fire bellows of 16
  gongs 16
  religions of 23
Javanese, decorative designs of 83
  influence of 7
  totemic hilt carvings 3, 5, 6
  types of handle carving 69
Jenks, E. A 15, 16, 31, 50, 98, 112
Johnston, W. T 6
Johore 22
Jolo Island 31
  bows from 2
  brass cannon from 29
  shields from 97
Jungle knives, types of 63, 66
Junks, Chinese 25
  Siamese 26
Kabunsuan, datto 22, 23
Kalinga, bows of 35
  customs of 89
  head axes of 91
  metal casting by 4
  poisons used by 56
  shields of 5, 96, 98 104
Kampilan 2, 4, 5, 63, 67, 74, 76
Kapok 13
Katipunan design 85
Kayan 24
Kline, Cathleen Cassel 5
Kline, Jacob 5, 35, 62, 84
Knife-blade machine 51
Knight, Edward H 64, 112
Knives 2, 4
Kota 27
Kris 4, 5, 63, 64, 76, 77
Kris dagger 67
Kroeber, A. L 112
Kutab Minar 18
Laguna de Bay, forts at 26
Lake Lanao, battle of 84
  kampilan from 71
  kris from 2
  spears from Moro of 5

Page

Laminated blade type 41, 83
Lantaca 4-7, 26
Lanao 13
Lauffer, B 12
Lawton, Henry W 28
Left, knife carried at 86
Legaspi, Miguel L. de 26
Lenman, Isobel H 5, 46–48, 78–83, 92
Lepanto, copper mining at 14
Limahong 25, 26
Lime, inlay of 5, 97
Linking, process in metal working 17
List, Max 79
Louisiana Purchase Exposition 3, 46–48, 57, 100, 101
Lubang, native forts at 25
Luk-dum 70
Luna, Juan 109
Luzon, bows from northern 31, 35
  iron industry of 29
  primitive tribes of 29
  weapons of central and northern 2, 5
Lyon, H. G 4, 28, 41, 42, 70, 95
Mabolo tree 13
Macabeta, datto 84
Macabebe 27
Mace, metal headed 45
Machete 66
Mackie, D. B 6, 56
Madagascar, fire bellows from 16
Madjapahit, empire of 19
Magellan, Ferdinand 21
Magindanao Moro 22
Malabang 93
Malacañan Palace 3
Malay, body armor, decorative designs of 106
  bow 30
  culture survivals 29
  dagger 82
  distribution of 21, 22
  fire bellows 16
  knot 72, 91
  migration of 7, 21, 22
  physical characteristics of 21
  shield 97, 106
  warlike character of 25
Mandarangan 88
Mandaya, dagger 84
  metal casting by 14
Mangyan, blowguns of 3
  bows 3, 34
  harpoons 3
  iron industry of 29
  spears 3
  type bows and arrows 35
Manila, attacked by pirates 25
  conquest of 26
  hemp 2
Manobo 22
Map of the Philippine Islands Frontispiece.
Masbate, island of, shields from 103
Mason, Otis T 72
Materials used in weapons 10
Mayinit 54
Mearns, Edgar A 27, 73, 91, 99, 104, 107
Median ridge of shield 97
Medieval chain and plate armor 108
Mediterranean, metallurgical center 17

Page

Melanesian culture influence 6, 52
Menang Kabau 23
Mentawi Islanders, tattoo marks of 88
Metallurgical centers 19
Metallurgy of iron 17, 18
Metals, influence of introduction of 8
limitation in supply of 14
Metal worker's tools 3
Metcalf, E. H. and S. S 4, 36, 40, 43, 54, 55, 86, 95, 103, 106
Methods of Philippine weapon working 14
Metropolitan Museum of Art 81, 109
Miller, Edwin Y 6, 59–61, 74, 112
Miller, Florence G 6, 62
Miller, Hugo H 112
Mindanao, interior tribes of 29
Island of 3
kris production in 78
use of bow in 31
Mindoro, island of, bows from 35
poisoned arrows from 34
Moats 26
Models of weapons 2, 69
Mohammedans, in the Philippines 90
influence of 7, 8, 11, 22, 23, 29, 90
Lubang, settlement at 22
Malay missionaries 22
at Manila 22
Mindoro 22
in Visayan Islands 22
Molave 13
Moluccas 30, 88
Moors and Moros 23
Moro, armorer, materials used by 13
arrows 2, 3, 31, 32, 38, 41, 42
axes 2, 93
beheading sword 2, 4, 93
blowgun types 61, 62
bow, use of 31, 35
coats of mail 106
chopper 1
cuirass 3
daggers 2, 4
fighting qualities of 26, 27
kampilan 2, 4, 5
knives 2
kris 2–5
metal crafts, superiority in 15
oblong shield 2, 4, 5
path splinters, use of 56
process of metal working 15
punitive expeditions against 2, 3, 56
rounded shields 97
spears 2, 3, 5
sword types 63
war complex of 26
war gongs 5
weapons and models 2, 4, 69
Moulds of clay 16
Mount Apo 88
Mountain Province 38
shields from 102
Mythology 26
McDougall, W 24
McGuire, James C 48
Nabaloi 76

Page

Nagas 88
Narra 13
Native inventiveness 19
skill in weapon production 19
Negrito, arrows 30, 35, 40, 42–45
blowgun, use of 50
bows 30, 35
culture borrowings 7
dependent on bow 32
distribution of 20
early occupation Philippines by 10
ethnic stock 19, 20
racial affiliations 20
shields 3, 97, 101
skill in arrow production 32
Negros, island of, bows used by natives of 35
swords from 5
New Guinea arrow types 44
Nias, island of, armor 11
shields 96
Nicobar Islands, crossbow from 31
Niello process in metal working 15
Nipa palm 12
Nonmetallic materials in weapon parts 12
Nueva Ecija, use of bow by natives of 31
Nueva Vizcaya, native use of bow in 31
Objectives of weapon catalog 7
Oblong Moro shields 96
Officers of the United States Army 1, 4
Ogee double curve design 77, 79, 85
Ogilby, John 80
Orang laut 27
Ornamentation, of bolo cases 73
of kampilan handles 75
Otis, H 28
Overlaying, a process of metal working 15
Oyster, D. W 6, 77
Oyster, William 72
Padded coats of mail 13
Pagan tribes of Mindanao, brass casting by 14
iron forging by 14
Palawan Island, type weapons from 6, 11, 35, 59–61
Palmwood bow staves 12, 35
Pampanga Province, bows from 35
River, estuaries of 27
Pangasian Province, bowmen from 30
Pan American Exposition 2, 6, 28, 39, 69
Panay, bolo types from 70
bows from 35
Panjis 56
Pantaleon, Mindanao 47
Parang and bolo, distinction between 62
Parang, ornamental designs on 5, 13
Parang-ihlang 63, 67
Parang-latok 63, 67
Parrying shields of the Moro 99
Patent Office 1
Path splinters 11, 55, 56
Patterns, ornamental, on weapons 7
Peabody Museum 65
Peale, T. R 1
Pershing, J. J 5
Philippine Journal of Science 34
Piercing weapons, classification of 8, 9
Pineapple leaf, poison extracted from 34
Pirah 68, 94, 95

Page

Pirates, Chinese 25, 26
Malay 27
suppression of 29
Piston bellows 11
blower 17
Pitfalls 56
Plaited armor 107
Pleyte, C. M 112
Plug for blowgun, of cotton 57
of pith 57
Plume holder 110
Poisoned darts and stones 11, 31, 57
Polished surface of shaftments 32
Pommel, human face carving on 70
Pompon, plumed 110, 111
Population, density of 29
Porcelain, Chinese 25
Pottery jars, Chinese 25
Potts, R. D. 6, 110
Powder, black 28
Practice shield 105
Praus 26, 27
Private justice 89
Proceedings of National Academy of Science 17
of United States National Museum 8
Pronged oblong shield 96, 102
Puas 56
Punal-de-kris 68, 85
Punitive expeditions 56, 107
against the Moro 3
under J. J. Pershing 5
Quinbasi 68
Quivers 3, 38, 60
Raids on villages 87
Rain capes 91
Raja 26
Rattan, as a tying material 12
bow cords 35
bows 2
bow wrapping 11, 31
braided bands 5, 37, 84
qualities of 12
reinforcing splints 29
shield lacing of 97
spiral bow cord of 36
uses of 12
woven 91
Rawhide cuirass 107, 108
shield 103
Realism of decorative design 85
Reaping cradle 2
Reed, W. A 12
Relacion de la Conquista de la Isla de Luzon 26
Religious impulse, a culture influence 23
Remontados 6, 29
Repeating crossbow, Chinese 31
Repoussé work, silver 5
Retana, Archivo del Bibliofilo Filipino 26
Rice planting and head hunting 89
Rickrack patterns 87, 103
Rio Grande River Valley, Moro of 27, 97
Roosevelt, Theodore 6, 71
Root, Elihu 112
Roth, H. Ling 113
Round shield of Moro 97
Russel, Edgar 4, 70, 107

Page

Saber, classification of 9
Sacred leaves 91
Sacrifice, abolishing of human 29
human, under house posts 88
Sacrificial feast 91
Salcedo, Diego de 26
Saleeby, N. M 13
Samal Moro, barong types of 69, 71
weapon collection from 6, 27
Samar, island of, knife from 87
weapon collection from 5
San Augustin, Caspar de 30
Sande, Francisco de 30
Sanskrit words in Tagalog 23
Sap of upas tree 33
Saracen missionaries 26
Savage weapons at the Centennial Exposition 61
Sawfish teeth blade 47, 48
Scabbards, metal inlaid 4
Schadenberg, Alexander 113
Scheerer, Otto 76
Scorpio, Roman 31
Seafaring weapons 61
Seattle Exposition 3
Self bow of Malaysia 31
Serpentine dagger 83
Shark's teeth used as weapon 9
Shark skin chagreen scabbard 81
Shaw, George C 5, 94, 104
Shelford, R. 113
Sheridan, James M 6, 46, 75
Shield, clubbed 17, 148
construction of 11
distribution of type 95, 99
inlaid 4
materials used 97
of northern Luzon 4, 96
ornamental fringe of 13
painted 4
pronged oblong 5
reinforcement of 102, 104
surface ornamentation 105
textile patterns on 4, 106
tufted 100
use in combat 96
Siamese, crossbow 34
fire bellows 16
gongs 16
junks 26
religions 23
Siculana, datto 109
Silicious stones, used as weapons 9
Silver, use of, on weapons 14, 71
Simalur, island of, crossbow from 34
Sinew 13
Singapore 1, 23
Sling shots 11
Smithy, operation of 17
Snake head carving 87
Spanish, adoption of native metallurgical methods 10
American War 1
armor of 27, 106
Christianization by 22
decorative designs 83

	Page
Spanish, early accounts by	30
influence of	7, 22, 29
medieval helmets	106, 107
political control	22
Spear, antiquity of	49, 50
distribution of	49, 50
fishing	3
hunting	3
materials used in	50
origin of	8
parts	51
Philippine types of	11
types of	52
war	3
Specialization in weapons	8, 65
Spring gun, bamboo	5
Spud, at end of shaft	55
Starr, Douglas N	4, 53, 70, 105
Steel blades	2, 11
Stewart, Alonzo H	3, 74, 86
Sting ray whip	47, 48
Stirrup	77, 80
Stone age in Philippine Islands	10
Stone hammers	14
Stone objects, early use of	10
Stotsenburg, Camp	36, 40
Stratton, Guy	28
Structural fibers	13
Subanun; war club of	3, 46, 47
Substitution of sacrificial forms	88, 89
Suga	56
Sullivan, L. R	113
Sumatra	19, 20, 23
fire bellows of	16
Sumpitan dart poisons	33
Sunda Islands	88
Sundang	68
Superiority of Bagobo brass work	15
of head ax of north Luzon	15
of Moro metal crafts	15
Suppression of blood feuds	90
of head hunting	29, 91
of spear production	91
Surface fibers	13
patterns	5, 97
Swaging, a process of metal working	15
Sword types, generalized	63
breaker	75, 76
classification of	9
clubbed	47
early forms of	8
obsolete forms of	66
type specimens	70
Symbolism of head hunting	87, 88
Tabas	38
Tagalog, bows of	31, 35
cutting implements of	2
weapon models	2, 69, 90
Tagbanua, arrow poisons of	34
iron industry of	20
Talavera, Luzon	28
Talibong	4, 63, 68, 94, 95
Tanguile	13
Target arrow	32
shield	96
Tarlac Province, bamboo trident arrow from	3
Tavera, Pardo de	23
Tawi Tawi Islands, shields from	3, 98, 104
Temper, how obtained	14
Temples, Hindu, in East Indies	23
Tension release, device for	36
Terciada	68
Textile pattern decorated shield	106
Tiger head carving, model of	68
Tinggian arrows	3, 35
head ax	91
metal casting by	14
quivers	3, 35
shields	3, 36
types of bows	35
weapons	3
Tinglayan culture area	98
Tiruray	22
Tongkaling, datto	88
Tongs, used in metal working	14
Totemic decoration on handle	1, 5, 6, 68
Tribal unit, small	88
Tribal wars, suppression of	29
Tribes of northern Luzon, metal casting by	14
Trigger, for gunstock	34
Trophies, and prepared heads	88–90
Truncated blade types	11
Trunion cannon	28
Tsurgi	81
Tubing, iron	28
Tubular bamboo weapons	12
Tufted shields	97, 100
Turkish swords	4
Type weapon models	10, 68
Umbril	110
United States Army, officers of	1, 4
Upas tree, sap of	33
Variants of kampilan blade types	75
Visayan Islands, bolo types from	70
bowmen of	30
bow, use of, in	31, 35
natives of	90
weapons of	4–6
Vocabulary of metallic hand weapons	66
Waddy	16
War clubs	6, 46
Warmsley, W. C	5, 38
Weapons of the Philippine Islands, variation in	5, 10, 11, 63, 70
Wheels, wooden	28
Wilkes, Charles	1, 79, 83, 93
Woman's knife	4, 85
Wood, Leonard	27, 107
Worcester, Dean C	67, 113
World's Fair Commission	3
Wrapped gunstocks	28
Yacan bolo case	72
Zambales Province, bows from	35
Negritos of	45
Zamboanga	27, 31, 99

SMITHSONIAN INSTITUTION LIBRARIES
3 9088 01421 2161

Q
11
U563
CRLSSI